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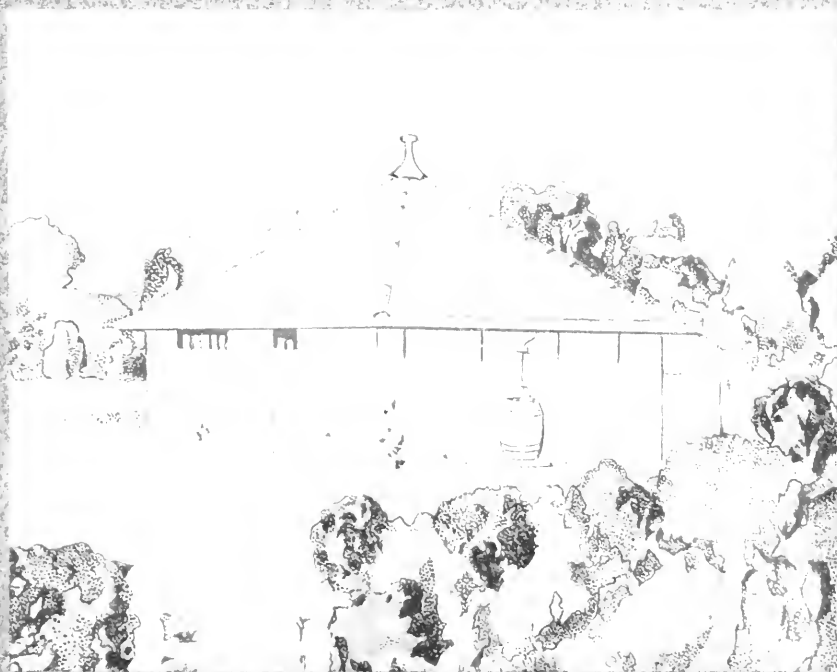
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THE
CHEAP COTTAGE
AND
Small House:

A Manual of Economical Building

BY

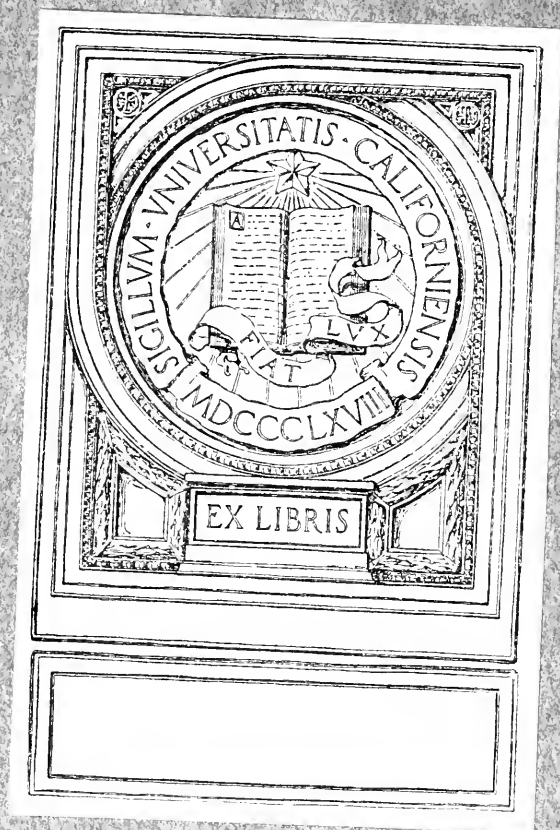
J. GORDON ALLEN, A.R.I.B.A., M.S.E.



PREFACE BY

LORD HENRY BENTINCK, M.P.

With Over 100 Illustrations
of Cottages costing from £105 upwards.



The Cheap Cottage and Small House.

PRESS OPINIONS OF THE FIRST EDITION.

The Irish Architect says: "This is one of the cheapest and most practical publications which we have seen on the subject, and it is profusely illustrated. The style of matter and illustrations is arranged to make it easy for the non-technical reader to understand, and almost every line of the text contains some sensible advice with regard to the arrangement of the economical home. It is a volume that should be in the hands of all architects and builders engaged in the erection of small houses, and under the housing of the Working Classes Act now operating in Ireland many small town schemes are in contemplation which require very economically planned houses."

The Scotsman says: "A well-considered and expert manual of economical building, the lucid exposition of which is supported by more than a hundred plain architectural drawings, the book cannot but prove serviceable and suggestive whether to small householders who are thinking of building or to readers interested in the 'cottage famine' and rural housing as a social problem."

The Surveyor says: "The handbook should interest the householder, landowner, estate agent, and those who have the carrying out of the Housing and Town Planning Act. In addition, the younger members of the building professions and trades, as well as the social reformer, may find it of service."

The Illustrated Carpenter and Builder says: "Mr. Allen gives so much of his personal experience, covers the ground so thoroughly, and withal writes so pleasantly . . . The book is intended for the general public, and is written without technicalities: at the same time, it may be commended to the attention of architects and builders who are concerned in the production of cheap houses, for they can hardly fail to find much interesting and instructive matter in its pages."

"In the preparation of this book, and we presume in his general practice, Mr. Allen has made a study of methods of economical building. A study of the houses illustrated will be a revelation to many in the possibilities of cheap building. Of course, cheap building of a sort is easily obtainable. But Mr. Allen does not countenance "jerry" methods. He is emphatic in asserting his belief that good building pays. The economies Mr. Allen effects are by means of careful planning—eliminating needless passages, avoiding greatly broken roofs, concentrating flues—and by the careful choice of materials and methods of construction. It is almost unnecessary to say that a "cheap" design is not necessarily a poor one. Mr. Allen's work, at any rate, proves the contrary; in the very cheapest cottages there are the notes of simple homely fitness, good proportion, refinement, and restfulness, which are chief elements of good design in domestic work."

The Yorkshire Post says: "Mr. Allen is a man of ideas. Some of his suggestions for detached villas of about £400 or £500 each are attractive, and the £200 to £250 houses look very comfortable. There are still smaller cottages, the cost of building of which is about £100 to £110."

ii PRESS OPINIONS OF FIRST EDITION

The Contract Journal says: "Anyone bitten with the prevailing mania for cottage building will hail Mr. Allen's work with delight. In it they will find not only a number of excellent plans of interiors, and charming elevations of houses costing from very little over £100, but also so many practical hints and so much commonsense and advice on the subject that they will be tempted to design their own dwellings."

The Daily News and Leader says: ". . . Mr. Allen's exceedingly clear and satisfactory chapters. His illustrations are a revelation of what can be done for £175, or even, where the building conditions were exceptionally favourable, for as little as £105. His diagrams deserve special praise, combining as they do in every case a sketch of the building with a plan. But the letterpress is even better. He deals with just those questions which concern not only the man who is going to build a small house, but also the women and children—and servants—who are going to spend more of their time in it. What can be done with attics, where mansards may be happily employed, the shaping of bedrooms, all sorts of sanitary questions, lighting, cupboards, and kitchen arrangements—are subjects discussed with brevity and point."

Garden Cities and Town Planning Magazine says: "THE CHEAP COTTAGE AND SMALL HOUSE, by J. Gordon Allen, gives some quite useful information and plans. The book is certainly the best of its sort that has been published, and its very low price makes it easily procurable."

The Citizen, Letchworth, says: "Of the many volumes on this and kindred subjects which owe their birth to the Garden City Movement, none we have seen gives, in more concise, practical and interesting form (and certainly none more cheaply), just the kind of information that non-technical readers contemplating the erection of a cottage or cottage property desire. The writer takes in his purview everything such an enterprise compasses."

Journal of the Society of Engineers says: "Though written in a popular style without any obtrusive technicalities, shows nevertheless that the author has a thoroughly sound knowledge of his subject. The completeness with which the subject has been treated . . . The book is well produced, printed in clear type, has an adequate index, and deserves to be carefully read by all who are interested in economical building and town planning."

Co-partnership says: "Particularly commendable by the fulness with which the author details his plans and sets forth the prices of materials and parts. Recognising the week-end habit as well as the increased favour of the countryside, Mr. Allen endeavours to help the people who are anxious to take advantage of the facilities now provided by tram, bus and train to get away from the crowded centres—and live in the country. He deals popularly and with professional accuracy on the selection of sites, the aspects of rooms, the outbuildings, plans and elevations, interiors, materials, sanitary matters, lighting and heating, building bye-laws, and cottage gardens. The book is thoroughly practical."

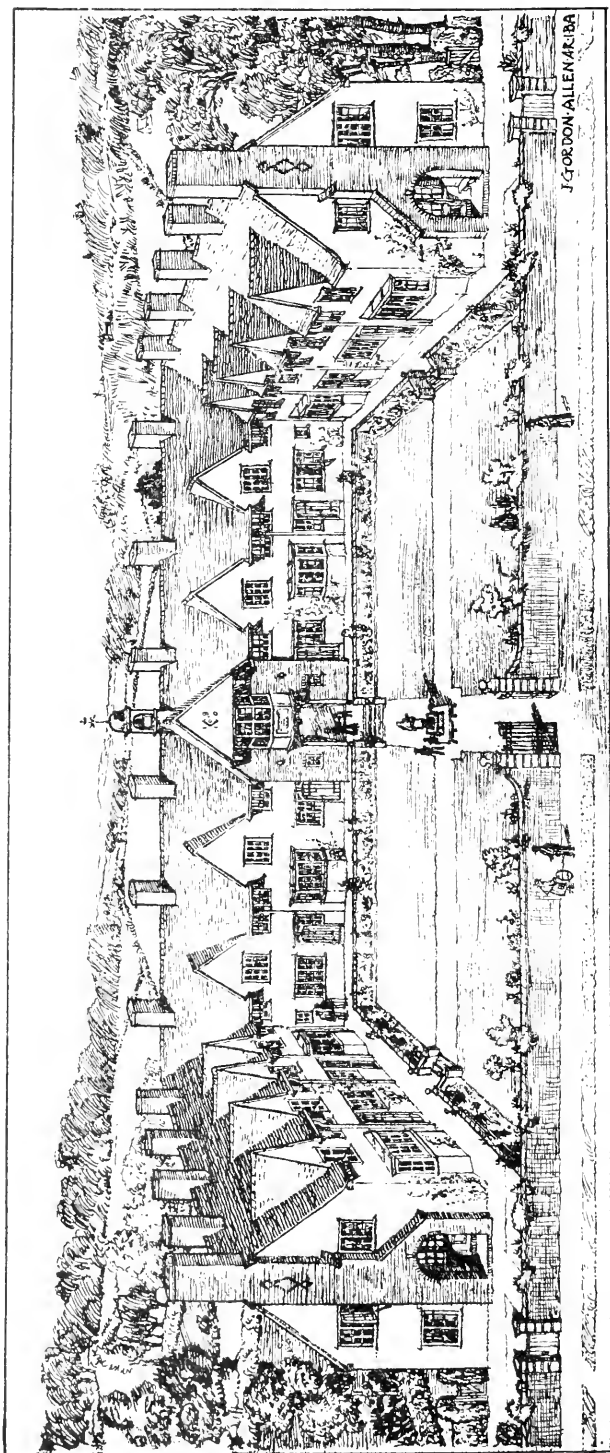


FIG. 1.—A number of small houses are shown here planned around a square. By this means picturesque and interesting effects can be obtained at a low cost, and expensive road frontage is saved. Such a system of grouping is particularly useful in the case of smaller dwellings, where the tendency to a monotonous elevation is greater. Each house has a small plot in the rear, and the central garden can be laid out in various ways for the common use of tenants. The accommodation of these houses is similar to that shown in Fig. 49.

THE CHEAP COTTAGE AND SMALL HOUSE

A MANUAL OF ECONOMICAL BUILDING

BY

J. GORDON ALLEN

*(Architect, Associate of Royal Institute of British Architects, and
Member of the Society of Engineers)*

PREFACE BY

LORD HENRY BENTINCK, M.P.

WITH OVER A HUNDRED ILLUSTRATIONS

FIFTH EDITION .

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INTRODUCTION BY LORD HENRY CAVENDISH BENTINCK, M.P.

The business of housing the labourer, the smallholder and the cottager is one which is receiving increased attention. There has of late been a discussion in the press as to which is the most beautiful village in England, and none could win the palm unless aged, moss-grown and picturesque. It is the object of Mr. J. Gordon Allen, in this book, to show how we may build so that present and future generations may see beautiful villages growing up around them, that the labourer may not only be adequately housed, but that homely simplicity of construction may go hand in hand with economy, and that the face of England may once more be dotted with homes straightforward in their construction, simple and beautiful in their design. Simple, because needless ornament destroys the effect of repose which the exterior needs, and elaboration inside the cottage merely harbours dust.

The village has its slums no less than the town. Many a tourist who surveys from some hill top the tower of a church nestling among the trees, the red roofed cottages where smoke curls slowly skywards, turns away satisfied that God is in his heaven, and all is right with at least one corner of the world. But could the same tourist only come into the village and see the low ceilings, the damp brick floors or climb the tortuous ill lit ladders which do duty for stairs; could he then be conducted into the two tiny bedrooms which house perhaps a man and his wife, and a baker's dozen of children, such a man would turn away both sadder and wiser.

It is the business of societies such as the Rural Co-partnership Housing Association to rouse public interest in a deplorable state of affairs, to get at the countryfolk, help them to build and to teach the landlord how such work may be undertaken at not too great a cost. Hitherto, one of the great difficulties with which these societies have had to

contend has been their inability to offer practical advice as to a suitable type of cottage; for until recently there has been but little study given by architects to the necessary designs, and, what is even more important, to the cost of construction.

Mr. Allen's book is eminently fitted to instruct the enquirer. It is recognised that one of the greatest obstacles to rural housing is the unnecessary restrictions imposed by the various by-laws. Their alteration is imperative, but, under the most favourable circumstances, will take some time. Meanwhile Mr. Allen has made a study of economy. A study of his designs is a revelation. Comely little cottages can be built for £105, and need in no case cost more than £130. The writer advocates good construction, and teaches us how to obtain it at a small figure. He effects his economies by careful planning; concentrating his flues, doing away with all needless passages, making a careful choice of his materials. He is no mere experimenter, but gives us the benefit of his experience. He takes the problem in a logical order: the site and water supply are made of the first importance: the size of the cottage is related to the possibilities of the neighbourhood—even the lodger comes in for consideration—the materials, the cost of construction, local by-laws, gardens, are all treated with the necessary fulness, and the excellence and variety of the designs, complete a book which is valuable alike to the landlord, the county councillor, the social reformer, and all those interested in the problem of the "rural exodus."

HENRY BENTINCK.

July 30th, 1912.

AUTHOR'S PREFACE

THE national question of rural housing receives a good deal more attention now than it did four years ago, when the first notes for this little book were made. But the depopulation of our countryside still goes on apace, thanks largely to the cottage famine in agricultural districts. In many villages it is impossible for the sons and daughters of the farm labourer to get married: there is never a single cottage to let. This appalling dearth of house room is intensifying owing to the existing buildings falling into unremediable disrepair, to the demand from old-age pensioners and from townsmen brought by better travelling facilities.

Quiet and cheap living among natural surroundings meets with greater appreciation as city life becomes more strenuous.

When we speak of overcrowding, we generally think of town slums. But the overcrowding in country neighbourhoods is often quite as bad, and much less excusable. Many are the instances where, year after year, it goes on unchecked in unsanitary, rotten dwellings. Picturesque they may be from outside; internally the condition of a great number of "the cottage homes of England" is disgraceful. It is useless to prosecute the tenants. For the cases where people voluntarily undergo the evils of overcrowding are few compared with the cases where cottages are overcrowded because no others are available. The sanitary law also cannot be enforced owing to the absence of houses.

In this handbook an attempt is made to throw a little light on the subject of cheap building. Some of my designs have appeared before in *The Architect*, *The British Architect*, *The Building News*, and *The Illustrated*

Carpenter and Builder. Mr. Clough kindly lent me illustrations of two of his cottages ; and I have also to thank the London County Council and their architect, Mr. Riley, for the loan of plans and photographs of some of their excellent cottages.

The author will be pleased to receive information or suggestions calculated to make the book more useful.

J. G. A.

13, Holmdale Road,
West Hampstead, N.W.
March, 1912.

AUTHOR'S PREFACE TO THE SECOND EDITION.

For this new edition of my book I have been fortunate in securing an introduction by Lord Henry Bentinck, M.P., whose broad-minded sympathy in housing and social matters is well known.

The rapid sale of the first issue has necessitated this extra edition, in which a few alterations in detail have been effected. On another page will be found some press opinions of the book.

I think it is worthy of note that in spite of its low price, the book has been produced under the best conditions of labour.

THE AUTHOR.

August, 1912.

CHAPTER I

INTRODUCTORY

IMMIGRANTS AND EMIGRANTS

ONE of the most curious tendencies of the fluidity of modern populations is that while the rural labourer continues to migrate to the towns, there is an increasing counter-migration of well-to-do townsmen towards the country. The two streams, however, do not effectively balance one another, since the former city-dweller who makes his home in the country still has his daily work and many of his interests in town. But they have at least the common feature of causing a good deal of dissatisfaction in the quarters from which the movements take place. Both are stigmatised as symptoms of the restlessness of the age, and an all too evident sign of national decay.

It is not proposed to go deeply into such matters as these in the present book, but rather to deal with the actual building of the economical small house, having due regard to healthy and eye-pleasant conditions. Nevertheless, there are certain aspects of the question to which attention should be drawn.

CAUSES OF RURAL DEPOPULATION

Towns are undoubtedly attractive to all classes of people. Their higher rates of wages, greater facilities of remunerative employment, and social and educational

advantages play no small part in causing the countryside to become dispeopled.

However, it is now generally agreed that the scarcity of rural dwelling accommodation is one of the chief causes of the absence of inhabitants in English villages. This forces the farm-workers into the nearest town or London, adding to its overcrowding and embarrassing an already overstocked labour market, greatly to the disadvantage of the older residents.

During the last decade considerable attention has been given to the supply of houses and tenements in or near town areas, but what is often the source of the trouble—the house famine in rural districts—has, as yet, hardly been so much as touched.

LACK OF RURAL DWELLINGS

The crying need of inexpensive and sanitary cottages in the country, and also in the neighbourhood of mines and factories—for labourers, small holders, and “back-to-the-landers”—is one of the most real grievances of the social reformer. He has not much difficulty in proving that rural depopulation and overcrowding in towns are intimately connected with each other.

The housing question is also at the root of all sanitary reform. Jerry-built, badly drained and unsanitary houses lead to disease and lessened vitality; and these in their turn have serious physical, mental, and moral effects on the inhabitants. Overcrowded houses have the same physical effects, and even worse moral results. In some villages, if the Public Health laws were really carried out, the consequence would only mean a little more overcrowding.

Enquiries made by various authorities into the condition of dwelling accommodation in hundreds of villages

chosen from all parts of the country, show decisively that the cottages are in most cases—

(1) Insufficient in quantity :

(2) Inferior in quality.

To find a good cottage vacant is very rare indeed, and more than once families have had to be sheltered in the workhouse, because they could not get a house to live in. Cases have occurred where engaged couples have, in order to marry and live in their own house, left their native village and helped to swell town populations.

In some places the number of cottages is decreasing rather than increasing. The old dwellings, picturesque as they often are with their honeysuckle and ivy-clad walls, are frequently rotten and ruinous, and more often than not, the arrangements as to light, ventilation, water, and sanitation seem to be in an almost hopeless condition. The demand for country cottages everywhere exceeds the supply, and lately has become intensified by the limited number of dwellings falling into disrepair.

For some years past on many estates in various parts of the country, it has been customary to pay the smallest possible wage to the agricultural labourer, and to charge him a non-remunerative rent for his cottage. In this way all local building enterprise has been killed. Under 2s. 6d. per week is the average rent paid by farm workers, and builders have naturally been quick to realise that this sum fails to provide sufficient interest on the outlay required for a new cottage—let alone the price of the land. They are not able to compete with generous landlords who established rents far below the then value of the cottages. Now that those landlords have finished their work, and economical laws are avenging themselves, it is seen how much better it would have been had good wages and commercial rents been the rule. Perhaps

through altered conditions of trade and the depression in agriculture, landowners and others look out for immediate financial return from money spent on houses nowadays.

It is obvious that private enterprise has failed to provide sufficient rural housing accommodation, and that some other agency—municipal or otherwise—must assist in the work, which is nothing if not a national question. All bodies should be encouraged to help, for the splendid work done by the co-partnership societies has shown the benefits of co-operation. The political parties are at last recognising that holdings or allotments, whether owned or leased on a secure tenure, are of commercial value to the nation (as well as to individuals), so it appears that something will soon be done. It has been stated that the comparative non-success of the recent Small Holdings Act is due in a great degree to the absence of house-room in country parts.

BY-LAWS

Then again, the building regulations of the Local Government Board have had the effect of deterring the erection of cheap rural cottages. They often add needlessly to the expense of building, as we have attempted to show in Chapter X. Of course, it is desirable to keep up a high sanitary standard and to prevent flimsy construction and unsound design. But some of these limitations, however imperative they may be in crowded towns, are unnecessary in the country where buildings are often of a single storey in height and far apart from each other. There is little danger of fire and infectious diseases spreading to the neighbours.

IRISH COTTAGES

Ireland has tackled the subject in no half-hearted manner. Since the competition for cottage plans held

by the Irish Local Government Board in 1906, some 23,000 cottages (many after the style of Fig. 3) have been erected in various parts of the country at a cost of four and a quarter million pounds.

Practically all of these dwellings—and others built by some of the municipalities—are one storey in height and extremely well-built, and they have been of immense benefit to the community at large. Nearly four thousand more are to be completed shortly. In all cases they are only for genuine agricultural labourers, and let from 1s. 1d. upwards per week—a rent which simply covers the interest on the cost of construction.

It is certainly not surprising that a Member of Parliament representing an English agricultural constituency stated, when Mr. Redmond was promised the further grant of £1,000,000 in July, 1910, that he was almost tempted to become an Irish Nationalist!

“THE COUNTRY COTTAGE CRAZE”

While, mainly owing to the lack of housing accommodation, it has been found extremely difficult to prevent the farm hand immigrating to the town, the city worker has shown a distinct desire to live in the country. The cult of the country cottage, which a few years ago was thought to be merely a passing whim, has recently developed apace. It is not limited to any one class of people; nor can it be considered anything but an entirely healthy and rational movement.

It is a sign of the times, and a good sign too. Improving means of travelling, the increased nervous wear and tear of modern city life, together with the much-advocated “return to nature,” all encourage those who are forced to work in crowded centres to make their home among country-side surroundings.

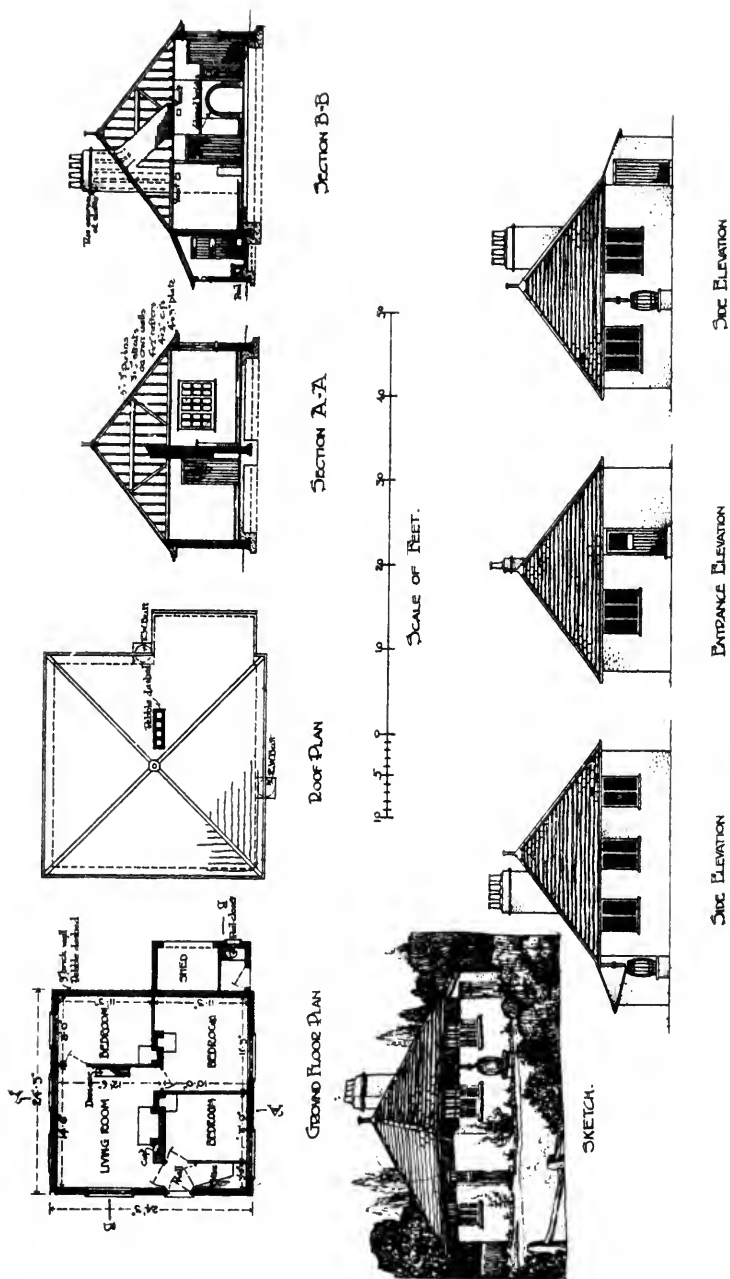


FIG. 3.—These drawings and the coloured illustration on the cover show a small bungalow cottage suitable for an agricultural labourer. Being square with a plain pyramidal roof, it is of the simplest and cheapest form, without having an unsightly appearance. As will be seen from the plans, there are three bedrooms, all with fireplaces, a living-room, and simple offices. The materials for building would be those easily accessible, and allowed by the local by-laws: brick or concrete walls rendered with cement, and a tiled or slated roof being difficult to better. Allowing 4d. a foot for the cubed dimensions, the cost works out at just under £130, for which price it has been built in Ireland and this country.

Again, the Garden City movement, cheap cottage exhibitions, and the expansion of co-operative building show the townsman that he and his family can enjoy a cottage with a garden right out in the country at no greater cost than the suburban house or town flat; or at least it is possible to breathe the pure air, and live among natural scenery for one or two days out of seven at a low expense.

BENEFITS OF "WEEK-ENDING"

Sometimes the term "week-ender" is used in a reproachful sense, though not infrequently by those pecuniarily interested in some way. Really, however, the man living a simple life in the country will be both healthier and happier than the town-stayer; and as he is bringing up children superior in every respect to the town child, besides carrying mental activity into what are often uncivilised districts, he is of the greatest social use. As well as being of more value as a worker, the chances are that the individual possessing a first-hand knowledge of nature, and having a personal acquaintance with the rural housing question and the many problems connected with the land, will have an altogether saner outlook, which, without doubt, conduces to the welfare of the state.

Pathetic pictures have been drawn of the father wearing himself thin and bloodless by the continual travelling and rushing for trains, while the wife and children wax fat in the sunshine of some beautiful village. In actuality, however, most business men will be satisfactorily conscious that, as a rule, their morning and evening journeys are more than made good by their leisure moments being spent in the garden or on golf, and by the benefit of sleeping in pure air. They are glad that for their family

such advantages are uninterrupted, and take pride in seeing their children grow up healthy and well.

WEEK-ENDS FOR PROVINCIALS

In London, the week-end habit—or “the country cottage craze,” as someone has unkindly called it—is far more pronounced than among provincial folk; and the reason is not difficult to find. Although the conditions of life in country towns are hardly so strenuous as in the Metropolis, the city man of the former rarely thinks of living nearby where he works, as he can more often than not get to some outlying village by simply taking a penny tram ride from the market place. He appreciates his cottage home as much as anybody, but it is as a permanent dwelling rather than a week-end retreat.

To reach the open country is not such an easy matter to the Londoner, however. For even when the country area, measuring ten miles by six, is traversed, he only finds himself in the suburbs of “London-over-the Border.” Also, Londoners are tempted to go farther and farther out by the many railway companies, who almost without exception, specially cater for “week-enders”; while in provincial cities, the local travelling facilities are usually limited to one or two neighbouring villages.

SUBURBAN BUILDING

Besides the steady drifting of the better-off people out of towns, the gradual reduction of living accommodation in the centres of cities, coupled with town-planning on the outskirts, is exerting a uniform outward pressure into the fresher country air. This cannot fail to have beneficial effects on the national physique. Every true patriot has long deplored the deterioration in the health of our town-dwellers; and in these days all housing reformers are

agreed that the people should be encouraged and assisted to spread themselves over a larger area of land than is occupied at present, so that everyone may obtain a proper amount of light and air.

Until quite recently, the development of suburbs and the creation of new districts has either been left to chance, or to people whose interest has been purely a financial one. In this way some disastrous mistakes have been made in the lay-out of building estates. New suburbs that have been formed without method or plan have fallen a prey to the jerry-builders, who have been allowed to run up rows and rows of "brick boxes with slate lids" in streets of degrading ugliness. Hedges, trees, and old gardens are ruthlessly destroyed to make way for the maximum number of houses that can be crowded on the minimum area of land.

Up to now, each owner has developed his own little property in his own way, and we often find a large number of dwellings badly spoilt to provide a small or supposed advantage for one individual. If there had been formulated a well-thought-out scheme, in which each is considered with regard to the many, the community would benefit in every way. Street-widening and other after-improvements are extremely costly, and it is so much cheaper and easier to prevent evils than to undo them.

TOWN PLANNING

At last, legislation—in the shape of Mr. Burns's far-reaching Housing and Town Planning Act—is insisting on some sort of systematic procedure in the planning of new areas, in order that they may not form the slums of the future. The Act facilitates and encourages thorough co-operation between all concerned in the provision and

longer significant of a humble mode of life. Nowadays, one does not lose caste by moving into a smaller house ; and there are many cases of royalty living in country dwellings of smaller size than the residence of a local shop-keeper. Among the middle and professional classes, above all, has there been of late an ever-growing desire for a permanent retreat in the country, where they may live and work in seclusion, or retire frequently from their business in town.

The quicker means of transit by motors, bicycles, and cheap trains, together with the work done by house-boats, golf club-houses, and shooting-boxes have all helped to foster the movement. Another item that has played no small part in the breaking up of the larger establishments in town is the happy reduction in the number of domestics required in the cottage ; this servant question is far from inconsiderable.

The architect must study the habits of these emigrants from town. He must find out what sort of people they are, and what kind of life they intend to live in the house he is to design for their use. Some of them come to the country because they cannot work in town ; others will go to town because they cannot work in the country. Not a few come entirely for recreation. And a number find that they can follow their bread-earning pursuits equally well in the home circle ; the latter, however, is not always quite so pleased with the arrangement !

WHAT SORT OF ACCOMMODATION ?

These diverse needs and interests must all be catered for by the cottage designer. It is a much easier matter to supply the simpler requirements of the worker on the soil. This tenant, who must perforce live and die in the particular neighbourhood, demands little else than a

dwelling to keep him dry and warm. His wife, however, has other ideals. She hankers after a front parlour or "best room," which very likely may be exclusively occupied for six days out of seven by dust-collecting "ornaments." A cramped so-called hall and this stuffy little room must often be provided at the expense of what might otherwise be a large and pleasant living-room.

Of late, there has been an enormous increase in the number of women who have taken up positions in all trades and professions. They, just as much as the housewives from town, appreciate labour-saving arrangements in the home more than does the old-fashioned country dame. However, it is possible, without annoying anybody with new-fangled devices, to minimise the daily house work by a wise lay-out of the rooms. Such items as the accessibility of water and coals, and the efficiency of stoves, will also be well worth the trouble of careful consideration. In the following pages we intend to go into these matters in greater detail.

Although perhaps the born townsman may have to forego some conveniences to which he has been accustomed, it is generally found that an occasional minor disadvantage is more than made good by living in "the cottage in the country."

TWO HOUSES, HAMPTSTEAD WAY,
HAMPTSTEAD GARDEN SUBURB.
J. GORDON-ALLAN ARCHT. T. HOLMES & SON, HAMPTSTEAD.

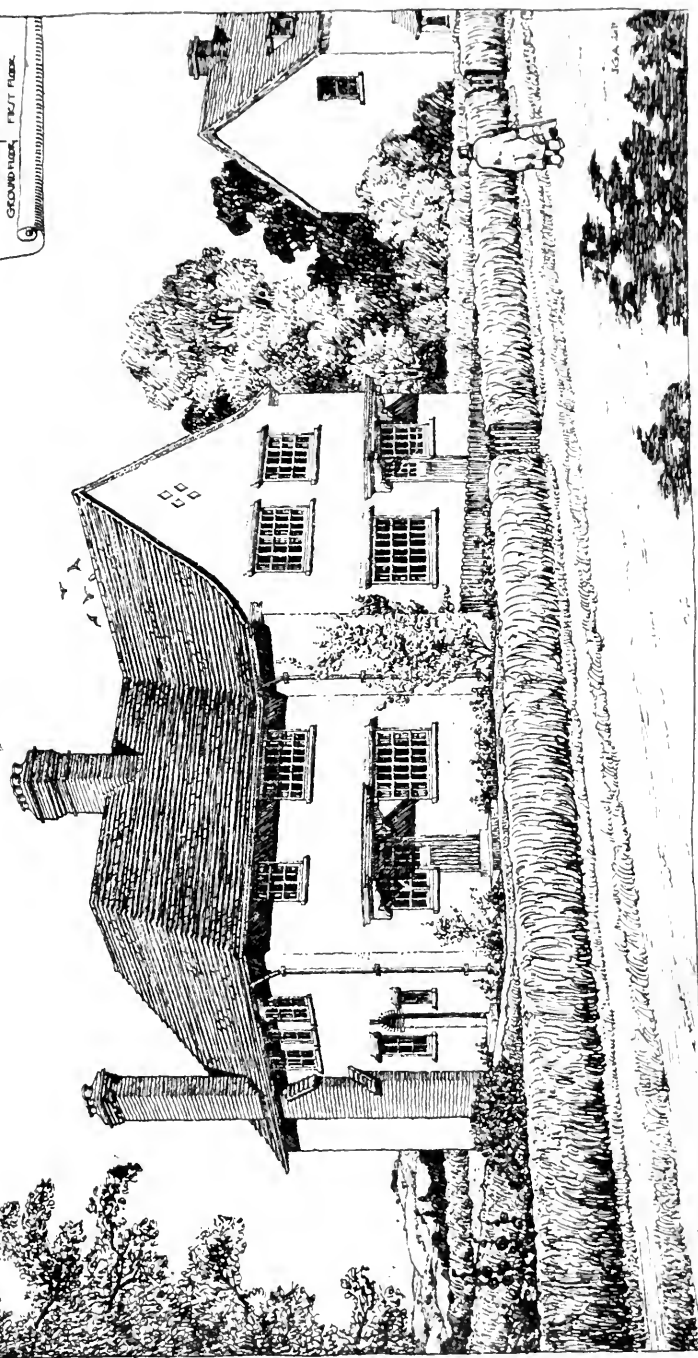
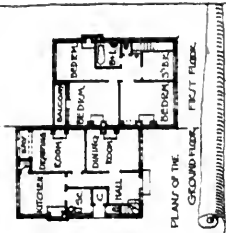


FIG. 6.—Built at the Hampstead Garden Suburb in 1908. Each of these two houses cost £470 to build. Although the plan—which is suitable for middle-class folk—will be seen to be alike, the elevations are different: one house was brought forward to match a similar projection on the opposite side of the road. A fair-sized hall and two sitting-rooms, one of which measures 17 ft. 10 in. by 12 ft., have been provided on the ground floor, and four bedrooms upstairs. Materials: Red brick chimneys, brick and roughcast walls, and a tiled roof.

CHAPTER II

THE SITE AND WATER SUPPLY

ALMOST as important as the design of the cottage itself is the selection of the site it shall occupy. More often than not, a certain position is available and none other ; but if the best result possible is to be obtained, this preliminary question should receive mature and skilled consideration.

WHERE TO LIVE

Usually the locality has been settled on the first thought of building, as perhaps we know the chosen neighbourhood slightly. But it is worth while making sure that it really does suit our health and temperament. For what could be more annoying than to find afterwards that the cottage is in a district that disagrees with the owner ? An occasional week-end in the place—when we are told that it is “very bracing” or “relaxing”—is hardly enough especially for those persons whose health is susceptible to changes of air and soil.

To individuals who are content with their own or each other's society, or who have a desire to be near friends—to be near the sea or river, or perhaps a golf-course, the natural beauties and advantages of the spot itself will not be so important. Nearly always, however, they must give thought to such considerations as the proximity of the railway station, shops, a doctor, and a good day school for the children. Again, the strictness of the local building by-laws has been known to influence choice ; while even

in some sleepy little village the matter of rates and taxes may give an unpleasant surprise.

THE NEIGHBOURHOOD

The City worker in London intending to travel daily to and from his business will not care to live more than about five-and-twenty miles out, on account of both the cost and the time spent in travelling. But if the cottage is only for use from Saturdays to Mondays, and other holidays, the distance may often be doubled. The man with offices near Charing Cross will not choose a neighbourhood on the Midland line, unless there is some very good reason; for even with all the tubes and 'buses, it is still a troublesome matter to get across London. Most decisions are also affected by the frequency of trains, and the time of the last one home at night.

Society men with no business claims may prefer a bungalow in the flat fen country or near the pines in the south, or possibly a cottage on the sunny slopes of Dartmoor. And if a proud possessor of a motor car, he can be quite independent of railway services.

THE ACTUAL SITE

The locality fixed upon, we have next to find a suitable site. In doing this, we are at once faced with a whole range of difficulties, on which will depend in a large degree the comfort and happiness of the cottage inmates. First of all, we shall make ourselves acquainted with the place, and visit all the highways and by-ways, asking estate agents, friends, and the lady at the village shop questions innumerable.

Each site proffered should be critically investigated before anything is definitely settled. What about present and future neighbours? Are the village schools, the

picturesque church with its ivy-clad tower (containing a bell), or the local public-house a little too close ? We may rather like the look of that farm-yard closeby ; but when we find that the plumpness of the chicken is due to adjoining gardens, and that the chorus of the ducks rarely concludes by sunset, our love grows cold. Possibly the pretty little brook that bubbles by so merrily is more harmful than it looks : there may be some primitive forms of drainage higher up stream ; and also a heavy rainfall is capable of surprising effects.

Although we shall naturally avoid the high road on account of the annoyance of passing traffic, which includes tramps, barrel-organs, and motors, we should like to take advantage of the public drainage system, and water and gas supplies ; and also to be near the post office and railway station. An uphill climb *from* the station is to be preferred, as it can at least be taken leisurely.

One cannot be too careful in making enquiries, or in having too legal a guarantee as to the class and value of buildings permitted to be erected on adjacent land. Although it is possible to secure and maintain privacy to almost any extent by the judicious planting of trees and shrubs, it is a good deal more difficult to protect ourselves from the nuisance of some adjoining factory which has been attracted to the neighbourhood by the low rates. Sewage farms and slaughter-houses are unpleasant things to have in the proximity ; and cement works and cemeteries are unhealthy as they give off carbonic acid.

It should be observed whether the road is made up and taken over by the local authority, for otherwise the cost may fall on the frontagers. Often the fine views obtainable from a particular site are the chief reason for its choice, so it is well to ascertain whether there is any likelihood of future building in the immediate neighbourhood.

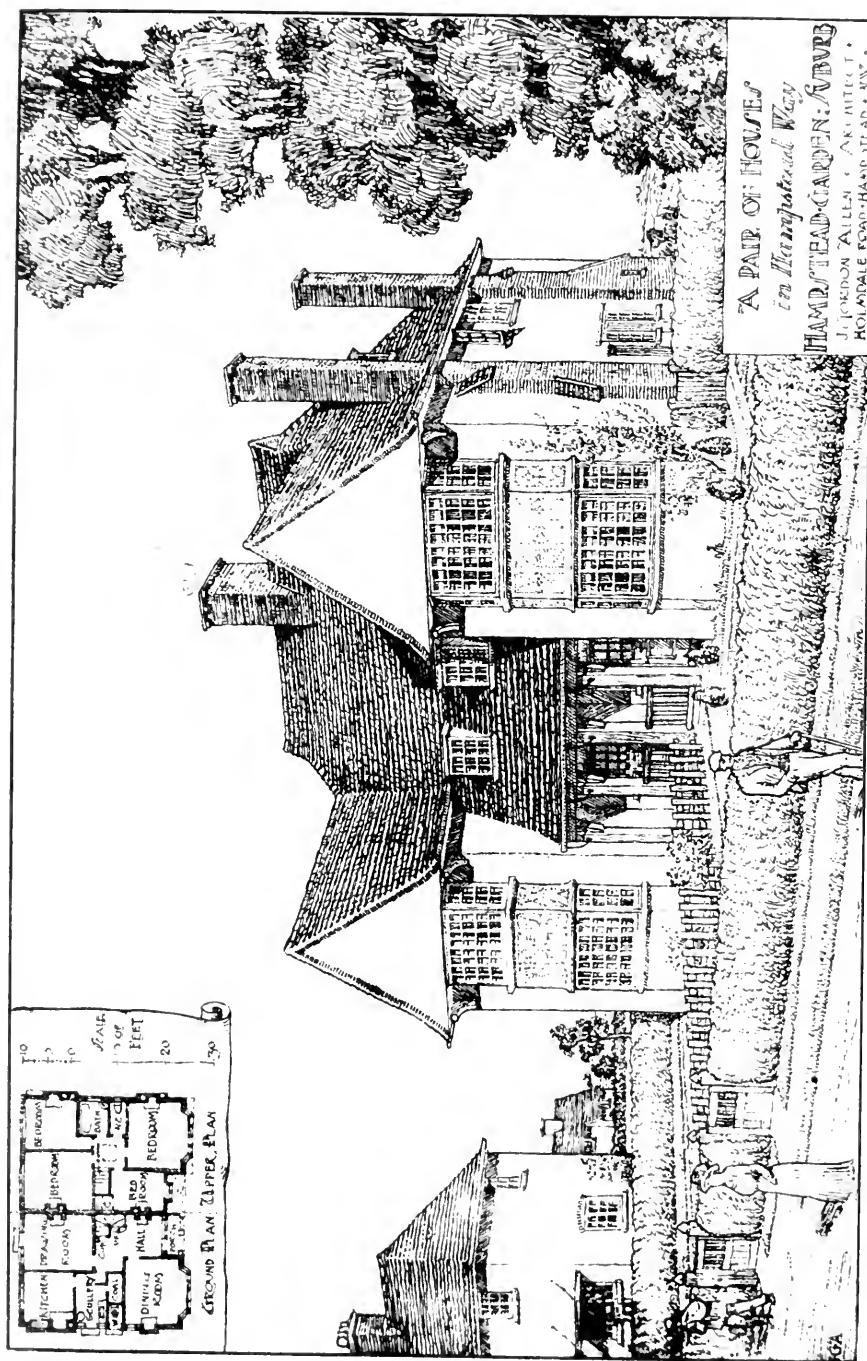


FIG. 7.—This pair of semi-detached houses was built in 1909 on a small site nearly opposite the houses last illustrated. The accommodation includes four bedrooms, bathroom, etc., on the first floor; and two sitting-rooms, a hall with a fire-place, and the usual offices below. This type of house is economical, as the roof continues down over the porches, thus saving brickwork. Red brick was used for the chimneys, Fletton brick and roughcast for the main walls and dark red tiles for roofing. Each dwelling cost just under £450 to build.

FREEHOLD *versus* LEASEHOLD

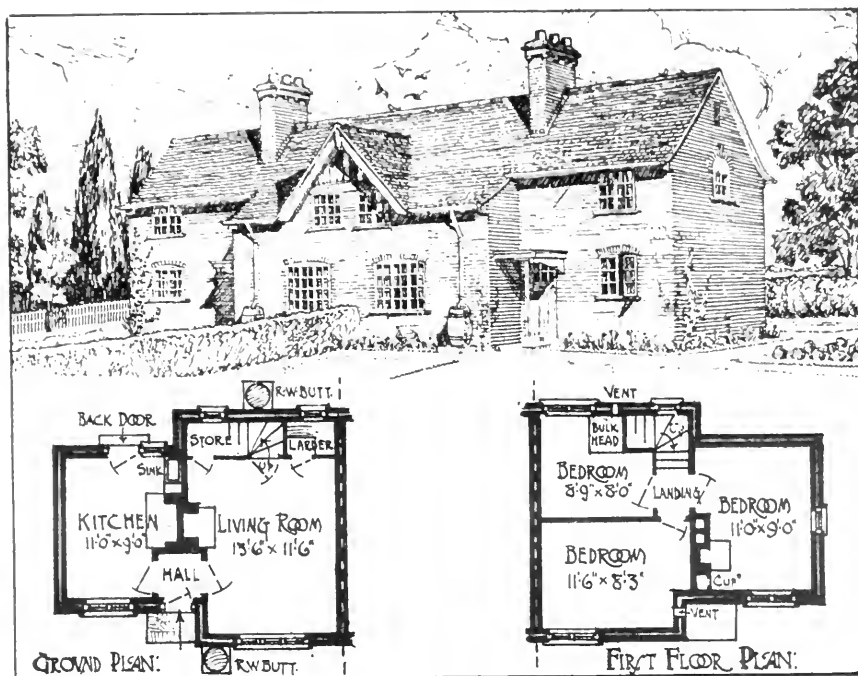
There can be little difference of opinion as to the advantages of building on freehold land, both for possible future realisation and for present purposes. At first sight, however, the comparatively small sum to be paid yearly for a leasehold property seems preferable to the higher price for its purchase. But when it is considered that the ground landlord is apt, and naturally from his point of view, to insist on the erection of substantial buildings of a certain value, one sees that the benefit of a building lease is not as good as at first appeared.

For those who think of buying one or two old cottages to adapt into one picturesque home, much expert advice—as regards the construction, as well as the validity of the title and deeds—will be necessary. The final cost usually comes to as much and often more than the price of a new dwelling ; and if the old buildings are taken on an agreement, it must always be remembered that, as the inevitable bill of dilapidations has to be paid when the property goes back to the landowner, the place is worth very little during the last twenty years or so of the lease.

Again, when one wants to make an addition to a house or garden which have been taken on an agreement or lease, it is generally found that spending money on other people's property is somewhat disappointing work.

A HEALTHY SITE

The influence of the soil on health is marked, and is more apparent in the country than in towns, where paving and drainage tend to obliterate the difference due to its greater or less permeability. No one associates rheumatism and catarrhs with the now fashionable London quarter of Belgravia, yet at one time the marshes of Ebury were scarcely habitable. Bronchitis, pneumonia,



FIGS. 8 AND 9.—This pair of small cottages was designed to special requirements for a rural district in Sussex. A working kitchen and a good living-room, with ample storage space were required, and there had to be three bedrooms upstairs; £270 the pair is the building cost, and the materials are tiles and bricks, the external walls being built hollow.



FIG. 10.—From this plan it will be seen that the hall, which contains an ingle-nook, can really be counted as a sitting-room: there is an alternate way to the front door from the kitchen. The stairs are so placed to render a back staircase unnecessary, and a pantry isolates the kitchen, and acts as a servery to the dining-room. Upstairs are five bedrooms, and all the usual offices and aspects are considered. Being in an exposed position, the external walls are made waterproof by a coat of smooth cement, the white colour of which contrasts well with the dark red roofing tiles. Cost: £850.

and kindred ailments are also fostered by dampness. The most pervious subsoils are the healthiest. Gravel, sand and porous chalk are best ; and clay and peaty land, which holds water, about the worst.

It is possible to effect great changes in the condition of the soil by a system of ground drainage, and by the addition or removal of trees and other vegetation. What is to be aimed at is to prevent the land—at least at the top few feet—from becoming water-logged, as in this state it makes the adjacent air cold and damp, and sometimes misty. Subsoil drainage is usually carried out by means of rough, unjointed agricultural pipes laid at about 3 ft. below the surface of the ground. The lines of pipes are from 4 ft. to 10 ft. apart, the distance varying with the porousness of the soil.

The best possible site has the ground sloping away in all directions, and while enjoying a free circulation of air in the immediate locality, there should be shelter from prevailing winds. High positions are preferable to low ones (which may receive drainage from higher levels), except where the place is on (but not at the top of) a steep slope, in which case the air is sometimes liable to be stagnant. In an exposed situation, tree screens are often useful on the north and east sides. They are apt to cause dampness and stagnation of air if too close to the house, and, as a rule, no tree should be nearer to buildings than at least its own height.

HOW DIFFERENT SOILS AFFECT HEALTH AND BUILDING.

The expense of building, besides depending on the accessibility of the site and its exposure to the weather, will vary a good deal with the nature of the foundations required. Moreover, a favourable soil as regards the cultivation of the garden is of great moment to the future

cottage owner. Carting in vegetable earth is a costly matter, and fertilising the ground still more so.

Gravel, free from loam and covered with a strong top soil, is pre-eminently the best for building sites, as it is porous and allows surface water to disappear quickly. Sometimes it can be built on direct without requiring foundations, but if insufficiently stiff to allow this, excellent concrete may be made out of the material itself. Where gravel is on the spot, and unless bricks can be obtained very cheaply, it is a saving to build concrete cottages. Lowland situations are likely to furnish the advantage of gravel.

Sand has the same characteristics as gravel, though to a less degree. It is a sure cause of cracked walls and ceilings if there is a possibility of its movement, either by the action of water springs or other causes. Sand is also an important building material.

Chalk is considered to be healthy, being generally permeable. Like sand and gravel sites, the loam on a chalky substratum is liable to be shallow, and will produce nothing in the garden without a great deal of attention. Where cropping up close to the surface, chalk become slippery in wet weather, besides being subject to fissures. It is usually found in hilly and elevated positions, which are dry enough but too exposed for those who wish for shelter in the environment of trees.

Solid rock is, of course, safe and strong ; but care will have to be taken in choosing the position of the cottage in order to reduce the expenses of levelling the site, and of excavation for walls and drainage. A trickle of water is sometimes found in rocky strata, and it must be seen that the foundation walls are not the means of forming a small pond.

The commonest soil in this country is clay, and it is found in many varieties, mostly in undulating and

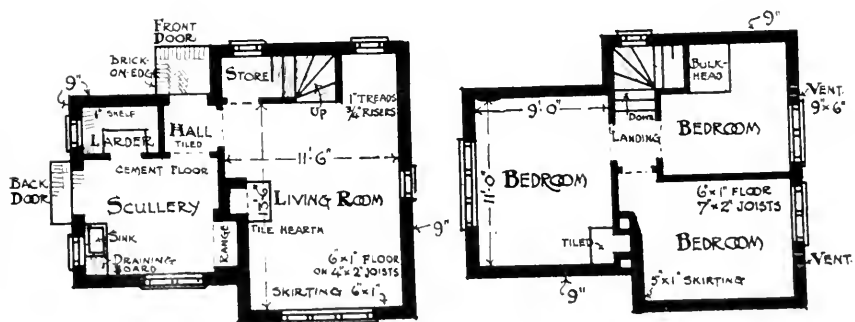
well-timbered land. Being impervious to moisture, though always damp itself, clay when underlining a site often causes the land to become more or less water-logged above ; careful drainage will make the site fit to build upon, though it may be an expensive business. A stiff clay makes a good foundation, especially if there is a porous subsoil not far underneath. When building on clay, deep excavations are necessary so that the footings will be out of reach of atmospherical changes, which cause shrinkages in the soil and settlements in the wall above.

“Made” ground should always be avoided. Consisting as it often does of animal and vegetable refuse, it is liable to ferment and putrefy for years with grave consequences to the health of the occupants of the house thereon, as well as to the stability of the building itself. This kind of ground is more common in suburban localities than in open country.

THE QUESTION OF WATER SUPPLY

This matter is closely allied to that of soil. Water, as well as drainage affairs, should be considered and settled before the site is fixed upon ; at least, concerning the source of the former and the outfall of the latter. Where it is impossible to take advantage of a public or a company’s main, one of the many other means of obtaining a pure water supply must be adopted.

Chalk generally holds water, and borings in sandstone or limestone often prove to be pure and constant sources of supply. Other water-bearing strata have been tapped successfully by means of artesian wells, but usually the best course will be to obtain a local geologist’s opinion on the matter. We may even employ a “dowser” or water-finder to see what he can do with his magic wand, provided that he will work on the “no cure, no pay” principle.



GROUND FLOOR PLAN:

FIRST FLOOR PLAN:

FIGS. 11 AND 12.—The labourer's cottage shown here was designed for special requirements, and built in Essex in 1910 for £130. Everything is as plain and simple as possible, and the stairs are partly in the slope of the roof, which saves a good deal of cubic space. There are three bedrooms, the largest being 11 ft. by 9 ft., and downstairs is a living-room and a scullery, with good storage space.

WELL WATER

If a shallow well, *i.e.* one not more than 30 ft. deep, is relied on for a drinking supply, it must, of course, be carefully located beyond all chance of contamination. A fact to bear in mind is that all underground water is liable to pollution by the percolation of foul water from surrounding ground. To minimise this, wells should be "steined" or lined with brickwork or concrete, which should be carried up above the ground as curb walls to keep out surface water. A cover is required, and a modern pump now takes the place of the old bucket and rope. Well water, and that from springs and streams, is liable to the double objection of becoming fouled, or of failing in times of drought.

RAIN WATER

In the country it is always useful to store rain water ; and in some cases this supply is the only one available for all purposes. When this is so, we must do without the picturesque rain water butt, and go in for an iron tank, or preferably an underground cistern. It is long before country people in town become used to its hard water ; and few Londoners realise the benefits and saving in labour and soap that are obtainable by the use of soft water.

It is usual to reckon that an average of 15 gallons of water per day will be required by every occupant of the cottage for household use. And taking the annual rainfall at 20 in. in depth, we get 600 gallons for every 100 sq. ft. of tiled roof, after allowing for evaporation and other waste. Slightly less is lost with a roof of slates. All pipes and gutters should be kept clear of leaves and nests ; and as an additional precaution for keeping the rain water clean, it may pass through a separator and a filter. Rain-water separators run the first washings of the roof to waste,

and divert the clean water either direct to the storage, or into a filtering chamber of shingle and sand, which keeps clean very much longer than it would otherwise.

UNDERGROUND CISTERNS

Tanks for storing water can be of concrete or brick 9 in. thick, cemented inside to make them watertight. They cost about 10d. per cubic foot of capacity, which works out at nearly 2d. for each gallon stored. Digging with one's own hired labour is an economical way of going about the work, after which the local builder may be employed to put up the walls. The roofing is either of stone slabs carried on iron girders. or it may be domed over with brickwork ; and in order to save expense in this direction, the cistern should be deep rather than wide. An overflow should be supplied, and the suction pipe of the pump is best kept about 6 in. above the bottom of the cistern, so as not to disturb the sediment. The tank will require cleaning out at least once a year, and this can be done by means of a ladder from the top. It may have a stone cover, or better still an iron manhole cover.

RAIN WATER BUTTS

These are cheap and extremely useful for supplying water for gardening and other purposes. One or two rain water butts in well-chosen positions add much in the way of old-world charm to a cottage-home ; and often an appreciable saving in the lengths of drains is effected by their use. They last longer if thoroughly tarred inside and well painted exteriorly. A good way to protect the base from rotting in the wet earth is to place the butt on a platform, and this arrangement also allows a pail to stand underneath the tap.

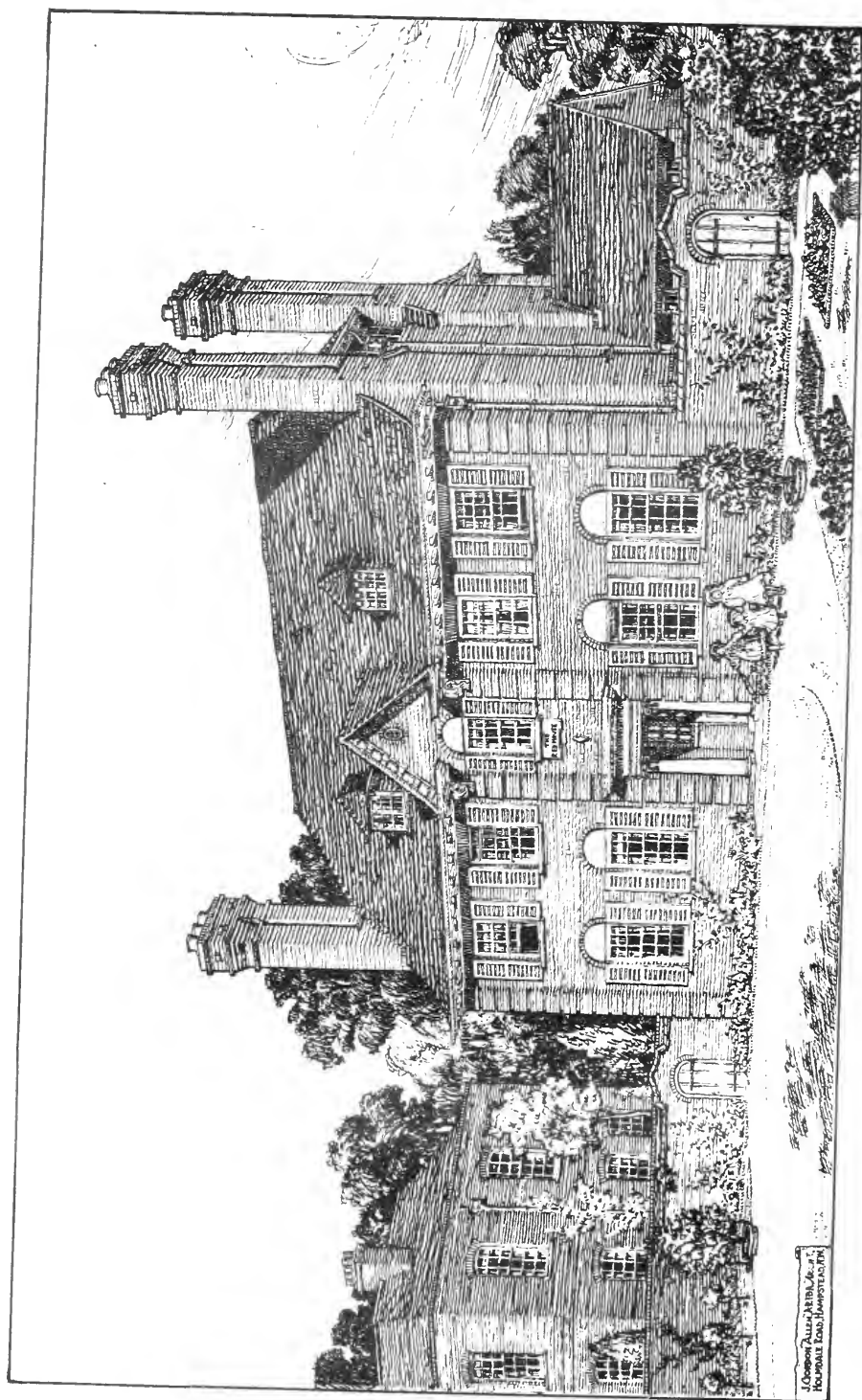
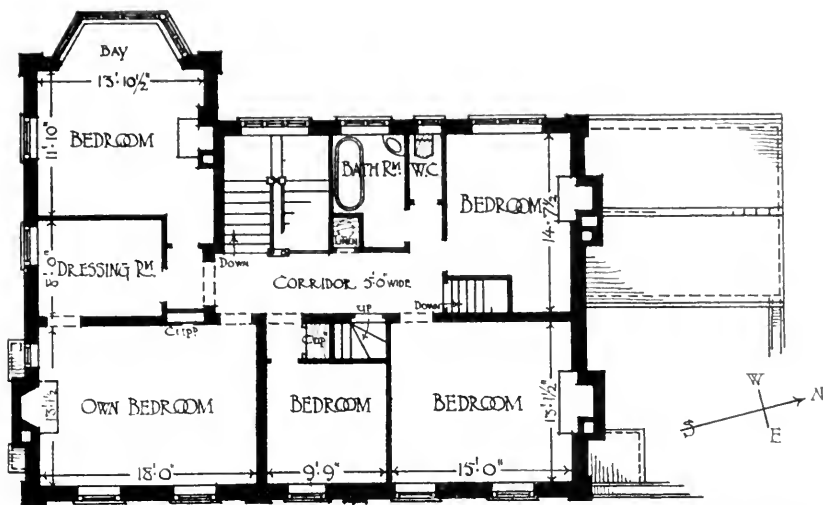
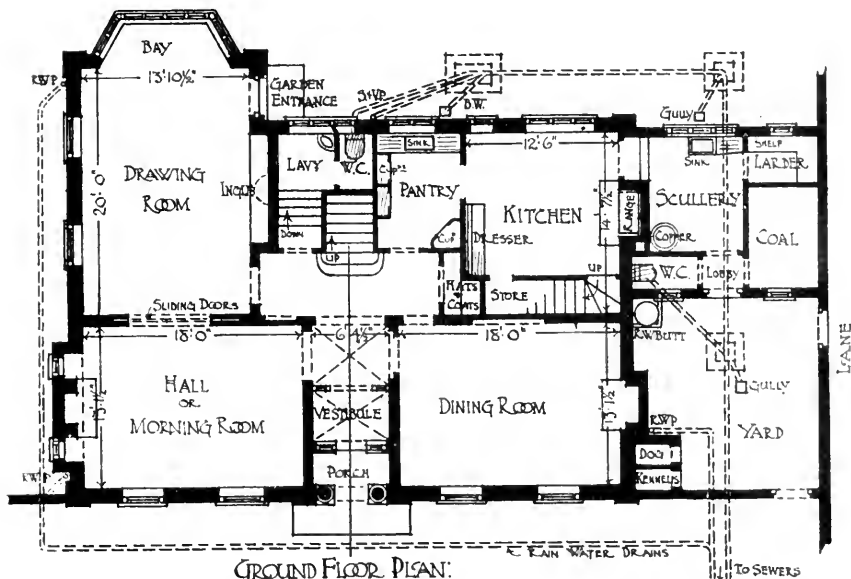


FIG. 13.—It was thought well to include one good-sized house in this book, if only for comparison. This residence, the plans of which are shown on the opposite page, is an example of domestic architecture of the Georgian style, and was designed for a site in a provincial town, where the neighbouring houses are of a similar character. Smooth plaster panels are over some of the windows, to which green shutters are supplied. The bricks are of an uneven colour, and the tiles dark brown.



FIRST FLOOR PLAN:

FIVE BEDROOMS, DRESS-ROOM,
BATHROOM & W.C. IN ROOF :



GROUND FLOOR PLAN:

FIG. 14.—These plans are of the house shown on the opposite page. The accommodation consists of ten bedrooms, five of which are attics, a dressing-room, and two bath-rooms, etc. ; of the three large sitting-rooms, two can be thrown together by means of doors that slide into the thickness of the walls. There is a lavatory under the main stairs, and a good cupboard for hats and coats in the inner hall. Cost : £1,600.

DISTRIBUTION OF WATER

Even when the water supply is found it may prove undrinkable, and there is often the difficulty of raising it to the required level. Hand elevators are generally the cheapest means of doing this ; or perhaps a small windmill or an automatic hydraulic pump can be made to work satisfactorily without much attention. Turbine-driven pumps are also used occasionally for raising the water to the surface and conveying it to the cottage.

STORAGE AND QUALITY OF WATER

Metal cisterns should be avoided wherever possible. Hard water has never been proved to contain bone-forming properties, and many ailments are aggravated rather than relieved by the constant assimilation of iron and lime into the system. Perhaps the chief mineral impurity to be found in domestic water supplies is lead, which may induce lead poisoning with its train of troubles. The plumber's craft is generally the source of the mischief. Lead pipes are attacked far more by the softer and purer waters than by the harder variety, which deposits a protective furring of lime on the pipes.

Too much reliance should not be placed on filters, many of which are quite useless. An excellent plan is either to boil or distil all water that is used for drinking and cooking, though care must be taken to see that it really is done.

WATER FOR BUILDING

While dealing with the question of water, just a word may be said about the supply for building purposes. When inviting tenders for certain work to be done, it is nearly always advisable to arrange that the builder should provide all the water required for carrying out the contract.

CHAPTER III

THE PLAN

FIRST CONSIDERATIONS

AFTER having acquired our site, we shall find ourselves faced with a hundred and one questions, all of primary importance and which need very careful consideration. What shape is the cottage to be, can we get the morning sun in the bathroom, and also see that beautiful view from the living-room? And more important still, how much will it all cost?

To ensure success in every way, the plans, whether of a single dwelling or a row of cottages, must always be designed to fit the site with its varying aspects, prospects, and configuration. There should be no such thing as a stock cottage, for no two sites have identical conditions. Our first object is to ensure that the sun's rays enter all the chief rooms at some period of the day, though we are not going to forget about the need of protection from the cold north-east winds and south-west gales.

HOW TO PLACE THE HOUSE

Tree screens break the force of the wind to an appreciable extent, and can often be planted for this purpose; while, if the site slopes—which is always preferable, more especially if it falls to the south—we shall not always find it judicious to build on the highest portion, but rather to choose a

lower position, where the rising ground affords shelter to the cottage.

If our plot is comparatively small, we must try to utilise it to the best advantage, and make the most of it by putting the building in one corner or another, instead of in the middle, which may cut up the garden space wastefully. Perhaps the north-east angle can be used for the house. If so, there will be a large garden patch, both sunny and well sheltered without being shadowed.

There is to be no "back" to the dwelling, nor are we going to line up with our neighbours and toe the building line, unless there is a real advantage to be gained by such an arrangement. Our chief care is to prevent any room from facing due north, and to do this we may have to risk offending the conventional eye by setting our cottage corner-wise on the site.

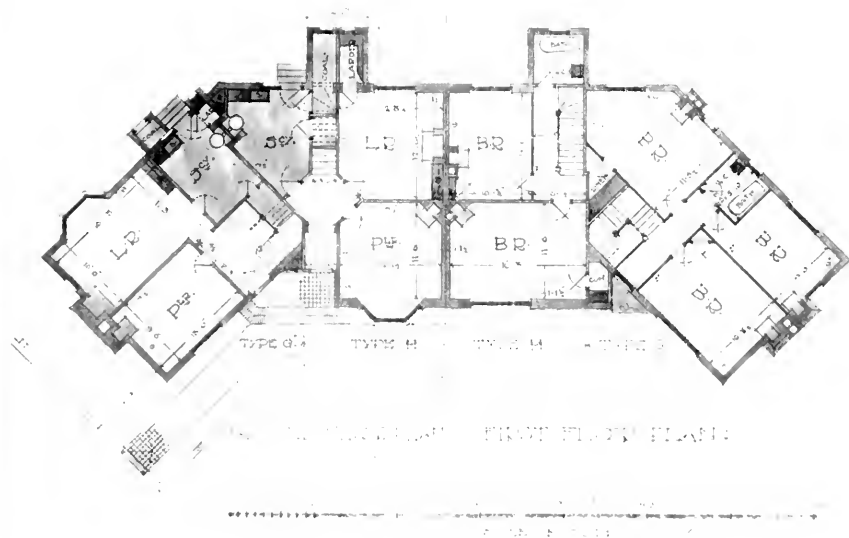
ASPECTS OF ROOMS

The value of sun in the right part of the house at the right time of the day cannot be over-estimated, and no rooms can be considered healthy which are not periodically disinfected by its rays. Much can be done by thoughtful disposition of windows in order to trap sunshine into the house. For instance, where we want to take in a special view from some main windows, or perhaps in an awkwardly-situated room, it is often possible to put in a small sun-window, which makes an enormous difference to the cheerfulness of the cottage. Or very likely, a window may be added solely on account of a view.

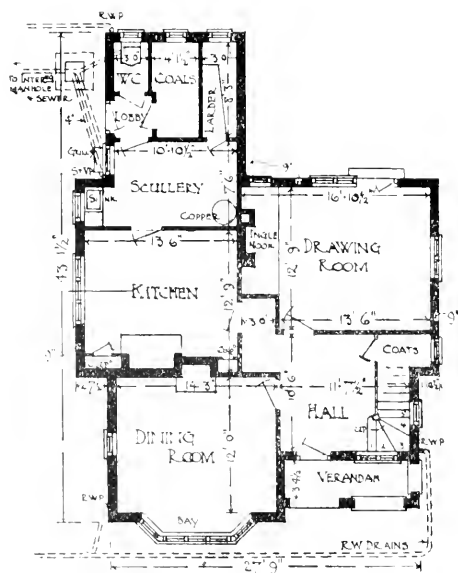
It is almost impossible to get too much sun into any part of the house, unless it be the larder or a dairy. The fruit lover may clamour for an expanse of sunny wall, but we shall decide that the best rooms are to have the first consideration. Early sunshine in bedrooms has surprisingly



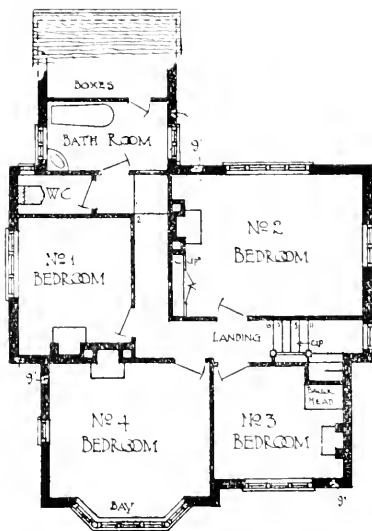
FIG. 15. THE FOUR SMALL HOUSES BUILT AT
TOTTENHAM BY THE LONDON COUNTY COUNCIL.
FIRST CLASS COTTAGES.



FIGS. 15 AND 16.—The block of four small houses illustrated here by photograph and plan is an example of the admirable cottage dwellings built at Tottenham by the London County Council, and designed by their architect, Mr. W. E. Riley. The centre two of these "first-class cottages" have the third bedroom, with a boxroom and linen cupboard, in the roof. All the rooms are of good size. Various types of L.C.C. cottages are shown in Figs. 20 to 23.



GROUND PLAN:



BEDROOM PLAN:

FIGS. 17 AND 18.—This house was erected in 1911 on a corner site at Hitchin at a cost of £550—a price which allows 6d. per cube foot. Its accommodation consists of a good hall, with a cupboard for coats, two sitting-rooms (one of which contains an inglenook), and four bedrooms, etc., upstairs. Materials: Red brick chimneys, roughcast walls with a tarred plinth, and sand-faced tiles on the roof and a portion of the bay-window.

beneficial effects on the health and spirits of some people ; and a bathroom in a similar situation has obvious advantages. Living-rooms likely to be used in the morning, then, should have a south-eastern aspect ; a drawing-room (or more correctly, parlour) may be farther west ; while the north-east side is best for the kitchen and offices, so that the earliest workers benefit by the rising sun before there is much heat from another source.

ACCOMMODATION REQUIRED

The exact amount of accommodation necessary in the cottage is by no means so readily determined as might at first sight appear likely. More often than not, however, the contrivance of all such plans will be controlled by strict economy. Every foot of space must be apportioned where it will most avail, and avail most often, for we need to provide first for the essential requirements of everyday life of the family who actually live in the dwelling. And only after this has been well done should the demands of luxury or the love of pretentiousness be considered.

Enlightened cottage-builders now realise more and more that when they sacrifice real needs to passing fashion or prejudice—the permanent to the merely temporary—the tendency is for their property to depreciate in value. If we can then, let us forget all about the suburban villa type of plan, which is often an awkward and cramped, though comparatively expensive, imitation of a mansion.

COMPACT PLANNING

In the actual planning the convenience of a small dwelling depends largely on the avoidance of a cramped result, but there is a distinct charm in many economies of space that give a delightful air of compactness to a home of any size. For instance, the manner in which the doors, windows, and

fireplaces are situated makes all the difference in there being an effect of roominess with plenty of elbow space, or the result having a confined and uncomfortable appearance.

Doors should be so placed that they shall not cause a draught when open, and care must be taken to avoid their clashing against each other and fire-places, furniture, etc. In every room a certain amount of plain wall surface is necessary ; and the uses to which each apartment will be put, and the furniture and fittings that will be required in it must always receive careful thought. It is well to show to scale on the plans such things as beds, baths, tables, and other furniture and the way doors open should always be indicated to make certain of a satisfactory result.

“MAIN LIVING-ROOM” PLAN

Whatever the size of the cottage, the chief consideration is the provision of a large sunny living-room. It should never be less than 14 ft. by 12 ft., and we must see that it is thoughtfully schemed for comfort and convenience. There are always many advantages obtained, where, instead of a number of tiny rooms, there is one spacious and airy apartment after the style of the old-fashioned “house-place.” The family will dwell together in this room, and the stairs open out of it and share its warmth.

A great advantage of this arrangement is that it abolishes the dark, narrow passage, dignified by the name of hall, along with the cramped staircase on one side, and the “best room” on the other. The remainder of the plan consists of bedrooms upstairs, and a working kitchen—or just a scullery in a more modest home—surrounded with the necessary offices below.

Many housing reformers advocate this living-room plan, for it is cheaper to build, effects many economies in the way of space, housework, lighting, and heating, and it is



BUILDING FOR ONESELF.

FIG. 19.

By kind permission of "The Daily Mirror." Drawn by W. K. Haselden.

distinctly advantageous on hygienic and artistic grounds. With such a room arrangement, an ingle fireplace will be more than ordinarily appreciated, and it is usual to have a small porch to screen off draughts from the front door. If the stairs are not wanted in the family room, the front door can open into a lobby at the foot of the staircase, and no porch will be required, which will be a saving.

IS A PARLOUR NECESSARY ?

Numbers of cottages of the type just described have been built during recent years for all classes of people. It is without doubt, especially well suited for mutually devoted families who like to spend all their time together when indoors. But the objection is that much privacy in domestic life is thereby destroyed. The student or the master of the house often requires another sitting-room where a quiet hour may be spent with book or pen ; there is always the problem of entertaining casual visitors, who are not wanted in the family circle, and to whom one does not wish to appear actually rude ; and what about indoor courting ?

“ THE FRONT ROOM ”

Cottagers will go far, and gardeners and coachmen have been known to give up well-paid situations to fulfil the wife's ambition of possessing a “ best-room ” in which to keep the china dog and plush suite. Of course, we as *practical* people think it far better to throw this room in with the kitchen, and make one airy compartment, but often the tenants are of a contrary opinion. To them, the little parlour which contains the old tea-service, that flower-show prize, and a certificate gained by the second son now in Canada, is a place apart, and in real sense the sanctuary of the home.

LODGERS

A parlour is found to be of much convenience where there is a young man lodger. To secure such a great help toward paying the rent, many households are ready to put up with any amount of overcrowding in the rest of the house. This consideration must particularly be borne in mind when planning cottages near a town. The special points to be taken into account are the placing of the offices and stairs so that they can be used without destroying the privacy of the family's sitting-room.

BED SITTING ROOMS

Often in a small dwelling it is possible to provide upstairs for those whose work or interests cannot be satisfactorily pursued in the family room. A well-lit nook between the fireplace and window in the largest bedroom is just the place for the son to do his home lessons, or the daughter her dressmaking. If considered beforehand, it is not difficult to contrive a thoroughly comfortable bed sitting-room by neatly screening off the bed and washing arrangements with the help of a solid partition, or just a stout rail for a curtain right across the room.

PARLOUR PLANS

There is no doubt that for the reasons mentioned, and many others, some third room on the ground floor is required in the ideal cottage. It should not, however, be given unless a sufficiently large house can be afforded, so that it may be provided in addition to and not at the expense of the living-room, which is far and away the most important part of any house. This parlour may have to be small, better very small indeed, rather than sacrifice the living-room.

As to the number of sleeping rooms, there is some

demand, generally by young married or elderly couples living alone, for cottages with two or even a single bedroom. As a rule, however, it is probably unwise to build a large number of dwellings having less than three bedrooms.

The living-room need not necessarily be the kitchen, for the scullery can often be enlarged to take the cooking-range, and become the room for all dirty work. Or if there is a parlour, a combined kitchen and scullery may be conveniently provided. In these days of gas stoves, and sitting-room fires combined with ovens, there are many ways of making the room in which cooking takes place comfortable and suitable for living purposes. When this is done a separate wash-house is generally wanted, and where possible, might be shared among several tenants. Another arrangement is to place the copper in a small covered yard. Such space can give access to the coal-cellar and w.c., and is a great boon for knife and boot cleaning, besides being most serviceable for storing pails and tubs.

THE POSITION OF DOORS

Although the doorway in a large room may be in the centre of one side without loss of comfort, more usually it must necessarily be situated as near a corner as possible. If this is done, it will open clear of the main portion of the room, and give a larger amount of unbroken wall surface. All sitting-room doors should be hinged to the longer length of wall which they adjoin, so as to screen the larger half of the room, including the fireplace.

The number of doors should be strictly limited, as their tendency is to render the place draughty and uncomfortable for sitting purposes. A second door or hatch for serving purposes in a meal room is rarely necessary, and is to be avoided, for it seldom saves more than a few steps—a gain which is not balanced by other disadvantages.

WINDOWS

Dealing now with the planning of windows rather than their design (which is treated in a later chapter), our chief requirement is to have sufficient light and air, while avoiding an excessive surface of glass, for the latter is very cold. We shall always exceed the minimum of window area required by the by-laws, which is one-tenth of the floor space. But it must not be forgotten that it is as easy to over-light as to under-light a room.

As a general rule, the best plan is to reserve one side of any apartment for the principal windows, all others being kept quite subordinate. Sills should be low enough to enable anyone sitting down to see out in the garden, while the heads of the chief windows must approach the ceiling level, unless other means of ventilation are provided.

Rooms opening out on to a veranda will be dark and sunless if they do not have independent windows elsewhere.

THE FIREPLACE

Family life in a cottage naturally centres around the living-room fireside, so that everything possible should be done to make it, above all things, comfortable and inviting, and carefully sheltered from draughts. When scheming its position a good method is to consider the possibility of a large household gathered around it on a cold December evening. Everybody must be enabled to obtain warmth, and no one should be in the way of the door, or too near a window. And we must not forget the person who wants to be near the fire and read at the same time.

In order to heat the whole of the room, the fireplace must be in a more or less central position and generally on one of the longer walls. Nothing taxes the income of the poor more obviously than the question of fuel, which is also

becoming a more and more serious item in the current expenses of every home. If only for this reason let us utilise the fireplaces to the best advantage by locating them on internal walls with as few stacks as possible. By concentrating the flues near the centre of the house, the whole building is kept dry and warm; badly drawing fireplaces are avoided; and a great saving is effected in brickwork, laborious and costly trimming of roof timbers, and expensive lead flashings, which spell disaster if left out.

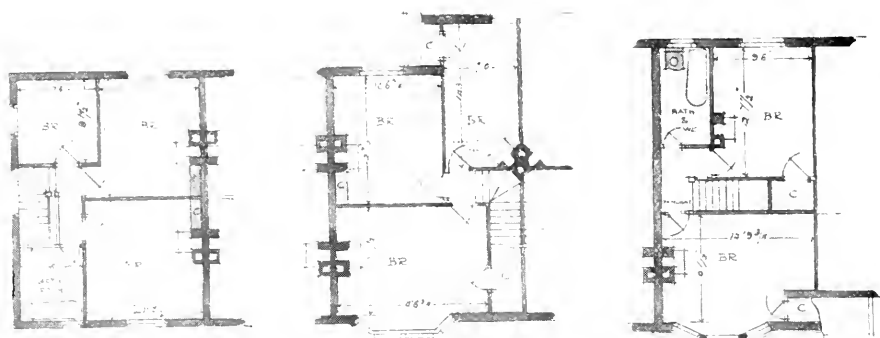
The chimney and the hearth usually project some 2 ft. 6 in. This creates some difficulty unless we can recess the fireplace from the face of the wall, or go in for an angle nook. An angle makes a cosy retreat, provided it is introduced into a room large enough to justify such a feature. To be really useful, it must contain comfortable seats, and be not less than 9 ft. or 10 ft. in width and about 4 ft. deep, and possess small windows of its own.

THE DISPOSITION OF ROOMS

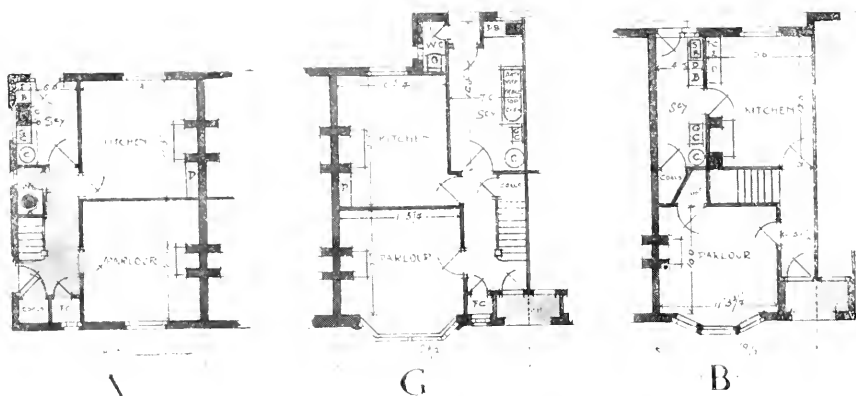
As the success of a house depends largely on the planning and arrangement of the various parts, we will consider each room in detail and in order in the following chapter. Of course, as every design is made to suit varying conditions of site, requirements, and local circumstances, the items can only be discussed more or less in the abstract. It is also impossible very often to obtain the ideal aspects for each room, especially in the case of a row of cottages. The recommendations suggested, however, may perhaps be of some service when it is necessary to choose between two or more positions for any particular case.



FIGS. 20 AND 21.—These photographs, and the plans on the following page, show various types of London County Council cottage dwellings, which have been built at Tottenham and Tooting. In these terrace houses, and in the block of four illustrated in Figs. 15 and 16, there is a party wall only between every pair of dwellings. It has had, however, to be carried up 15 in. above the roof—a needless, disfiguring, and expensive requirement, on which the more enlightened Councils do not insist. Fig. 20 is a view of cottages built at Tooting; those shown in Fig. 21 are at Tottenham.



FIRST FLOOR PLAN



GROUND FLOOR PLAN

FIGS. 22 AND 23.—Ground floor and bedroom accommodation of various sizes are shown in these plans, in which the

Average net area of Living-rooms is 165 square feet.			
"	"	Parlours	" 131 "
"	"	Bedrooms	" 144 "
"	"	Sculleries	" 88 "
"	"	Bathrooms	" 35 "

The elevations of these L.C.C. cottages are illustrated in Figs. 16, 20, and 21.

CHAPTER IV

THE ROOMS

THE ENTRANCE

IN a small cottage where there is a porch, an entrance lobby will rarely be required, though in larger dwellings some sort of vestibule is extremely useful for storing hats and coats. It is also convenient as an approach to a cloak-room or lavatory, if there is one on the ground floor. The front door is usually best placed on the north side, provided this arrangement does not destroy the privacy of the garden, for then the living-rooms can monopolise the southern frontage of the cottage.

The first and last use of a porch is to protect both the visitor standing in it and the front door from wind and rain, so it should not be less than about 4 ft. 6 in. wide inside. Anything of brittle construction is to be avoided, and it should not appear as an after thought or an excrescence from the main building. This danger is avoided where the roof comes right down over the projection, or where the porch is carried up two storeys high to the main eaves as in Fig. 47. Fig. 13 shows a porch fitting entirely inside the body of the building, which is perhaps as good a scheme as anything.

As far as appearance goes, glazed front doors, though often necessary for lighting purposes, are better avoided. A much more satisfactory effect is obtained with a wide, low door of heavy character. We must see that the door

does not clash with internal doors and that it does not open right on to the stairs, and there should always be enough room for visitors to pass the person who lets them in. Where space is limited it is often convenient to have the front door hung in two flaps (which need not necessarily be equal), as they take much less room when open. The cottage in Fig. 58 has a door like this.

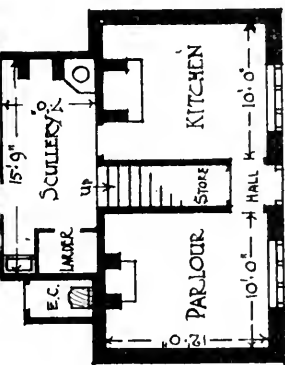
SITTING-HALL

A very good method, which is rapidly growing in favour where another sitting-room is required at a low expense, is to concentrate the entrance lobby and passage-ways into a compact hall. There are inconveniences of having the stairs in the living-room, but they will look well here ; and if we can have a fireplace, the room will be all the more comfortable and attractive. A closed anthracite stove, which will burn from twenty-four to forty-eight hours without attention, is very suitable for this position.

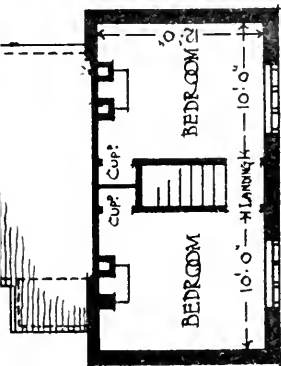
Such a sitting-hall need not cost much, for as the other rooms are grouped around it, all passages will be saved. It will also make a great difference to the convenience of the whole household in many ways, being especially useful for receiving casual visitors. In many of the larger country cottages, and also in modern suburban houses, the lounge-hall assumes extensive proportions, and is elaborately treated with ingle fireplaces, window-seats and recesses, etc., according to the ideas and means of the owner. When this is so, unless another way to the front door has been provided, the comfort of the apartment for living purposes is impaired.

OTHER LIVING-ROOMS

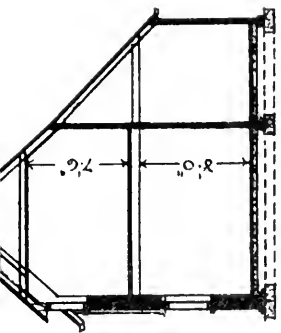
Like all living-rooms, the sitting-hall should face the sun, from whence comes all health and sweetness. About



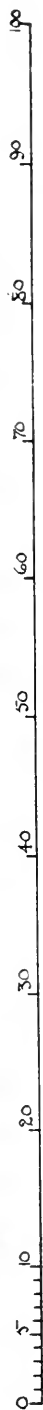
GROUND PLAN:



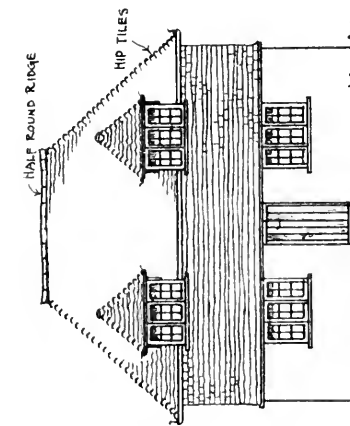
BEDROOM PLAN:



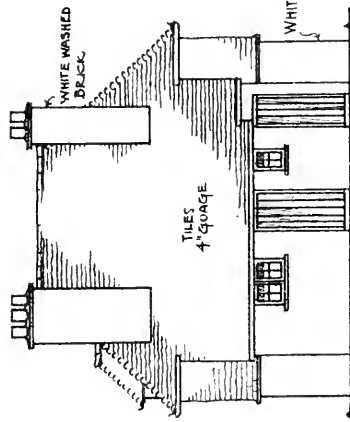
SECTION:



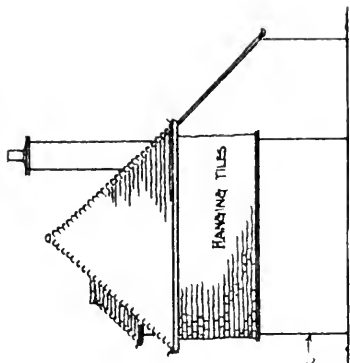
Scale of Feet:



FRONT ELEVATION:



BACK ELEVATION:



END ELEVATION:

FIG. 24.—We are enabled to reproduce the working drawings of this picturesque little cottage through the kindness of Mr. A. H. Clough, who designed and built it. It has been erected, along with a number of others, in several rural districts at a cost of £175, this price including builder's profit and architect's fees. The average price per cubic foot of Mr. Clough's various cottages is 4½d., which is low, but not so low as to necessitate the work being finished in an unsatisfactory or slipshod way.

15 ft. by 12 ft. should be regarded as the minimum size for a main room of any cottage, though, unfortunately, it often has to be smaller on account of cost. If the room is used all day, or just as a dining-room, south and east aspects are desirable, so that at breakfast and in the early hours it will have the benefit of the morning sun. Parlours or drawing-rooms are better with a south and south-western outlook in order to obtain sunshine in the afternoon, when they are likely to be used.

The width of a dining-room cannot be comfortably less than 12 ft. in the clear. This size allows 1 ft. 9 in. for chairs on each side of a table 3 ft. 6 in. wide, and a 2 ft. 6 in. passage-way all round. The term "elbow room" may be taken literally, for an oak chest or a low seat can often be put where a tall sideboard or bookcase would be much in the way.

STAIRCASE AND PASSAGES

As the stairs are so important as a chief thoroughfare, a little more attention than is usual should be expended on them, if the comfort and beauty of the cottage is to be assured. They must never be less than 3 ft. wide; nor should the "going" be steep. The shallower the riser, the broader the tread, so as to keep the stride nearly equal. A good rule is to make the breadth of the tread *plus* twice the height of the riser equal to 2 ft. Odd stairs and winders (or turnsteps) are to be avoided as a source of danger; and the latter tax the ingenuity of carpet layers.

It is essential that a staircase is airy and well lit. If windows can be arranged to come at the landings and be fitted with window-seats, they will be greatly appreciated by old people and invalids who find stairs difficult to negotiate. As a rule, stairs should be kept away from the front door, as a poor appearance is given unless they can

be viewed from one side. In the old-fashioned cottage they often led out of the big living-room in a picturesque and convenient manner. Not more than ten steps should come together in one flight ; and if creaking stairs are to be eschewed, the construction must be strong. Thin and spidery newel posts and balusters always look bad.

Roomy landings and corridors add much to the dignity and beauty of larger homes, but in our little cottage we shall always avoid them as being expensive and wasteful. A long passage, which in a small house for the sake of economy has to be narrow and perhaps dark, is a blemish to any plan. If we can, let us concentrate the space into a tiny square hall ; then there will be a convenient room, and a charming one, too, even if there are a number of doors in it.

KITCHEN

The range is the chief consideration in the cooking-room, and we must first of all take care that it has a left-hand light so that the cook will not cast a shadow over the saucepans and ovens to which she is attending. Cheap kitcheners are generally unsatisfactory. The best kind have a large surface of hot plate, but unless the latter is divided up into a number of sections, and is not less than $\frac{3}{4}$ in. thick, it will soon crack.

As with other fireplaces, this, the largest, should be on an inside wall in order that as much of the heat as possible can be taken advantage of in the house. As well as heating the adjoining room, it will keep the bedroom over the latter, and also that over the kitchen itself, so warm and comfortable that they will seldom need a fire in them. If a gas stove is required, very likely in addition to the ordinary range, it should occupy a position in a good light and where the flue can join the others in one stack.

PROPOSED HOUSE in CHADWELL HEATH LANE, CHADWELL HEATH, ESSEX for MR. P. A. LANTON.

The architectural drawings are as follows:

- Site Plan:** Shows the house's location on Chadwell Heath Lane, bounded by Eagle Road to the west and Chadwell Heath Lane to the east. The house is situated on a plot of 14.0 sq. m.
- Block Plan:** Shows the house's position relative to the surrounding street layout.
- Scale:** 1" = 10' 0" (1:120).
- Section A-B:** A cross-section of the house showing the internal structure, including the roof, walls, and floor.
- Section C-D:** A cross-section of the house showing the internal structure, including the roof, walls, and floor.
- South Elevation:** The front elevation of the house, showing the entrance, windows, and roofline.
- North Elevation:** The rear elevation of the house, showing the back garden and roofline.
- East Elevation:** The side elevation of the house, showing the side garden and roofline.
- West Elevation:** The side elevation of the house, showing the side garden and roofline.
- Ground Floor Plan:** Shows the layout of the ground floor, including the entrance, living room, dining room, kitchen, and bathroom.
- First Floor Plan:** Shows the layout of the first floor, including the bedrooms, bathroom, and landing.
- Roof Plan:** Shows the layout of the roof, including the chimneys and gables.

Architect: J. H. B. LANTON, 10, CHADWELL HEATH LANE, CHADWELL HEATH, ESSEX. 1937.

FIG. 25.—The block plan in this illustration indicates a symmetrical site on which have been built a number of semi-detached houses (see Fig. 26), with a detached house at each corner. This sheet of working drawings is of the corner houses, which cost £450 to build complete with fencing. The accommodation provided consists of four bedrooms, bathroom, etc., upstairs; and a large dining-room, with an angle-nook and angle-bay, drawing-room, and the usual offices on the ground floor. A large roof-room can be arranged if required. The walls are of red brick to first floor level, with roughcast above, and the roof is covered with Tucker's sand-faced Tiles.

PROPOSED HOUSES, CHADWELL HEATH LANE, CHADWELL HEATH, ESSEX, for MR. P. C. AUSTON.

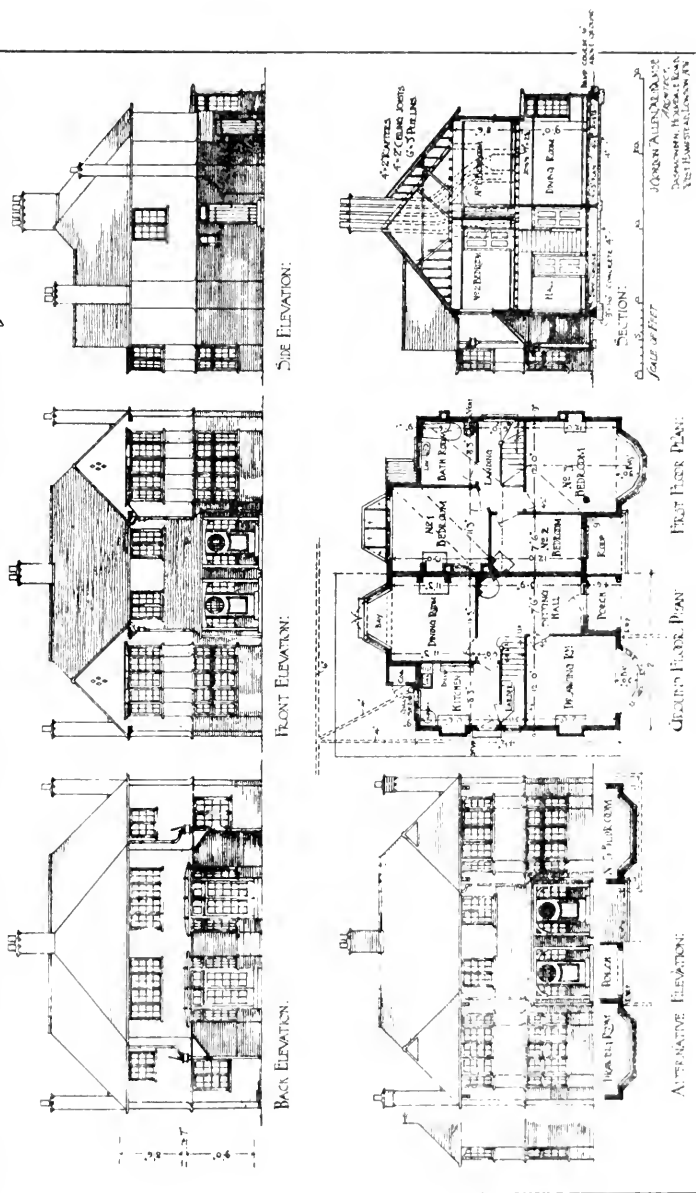


FIG. 26.—A number of these semi-detached houses have been built at Chadwell Heath, as shown in the block plan in the illustration on the opposite page. The elevations have been varied to avoid a monotonous appearance, and the materials used are the same as in Fig. 25. In these houses (which cost £370 each), there is a good hall with a fireplace, two sitting-rooms, three bedrooms, a large bathroom, and the usual offices.

The common faults in kitchens are that they neither have enough light nor cupboard space, so we must look to these points. Other items worth considering when planning a kitchen are a convenient position for the table ; means—by cross-ventilation if possible—for dispersing heat and smell from cooking ; and a certain amount of isolation from the main portion of the cottage, without, however, interfering with easy service to the dining-room and front door. There should be as few doors as possible opening into the kitchen, and all may be well kept away from the range, except that to the scullery.

China standing on open shelves soon becomes dusty and requires much unnecessary washing. Instead of having the ordinary dresser, a better arrangement is to store the plates and cups in the old-fashioned kind of sideboard. This consists of dust-proof cupboards having sliding doors (which can be glazed) formed on a table top that has drawers and more cupboards underneath.

Although recommended by some, and bearing in mind that no additional heat is required from the sun, we shall not have a northern outlook for our kitchen. No aspect is more depressing for those who have to make it their only sitting-room. More towards the east is better, for then the early workers get the advantage of the rising sun before there is much heat from elsewhere. Where the room is used for living purposes, a more southerly aspect still should be provided, though artisans and servants often prefer a lively prospect—such as a glimpse of the high road where passers-by can be seen.

SCULLERY

When scheming a scullery, a good way is to treat it as a part of the kitchen. There need not even be a door between them, though the absence of one is liable to detract

from the comfort of the kitchen as a sitting-room. The sink is the important factor in sculleries, and should have a wide draining board of hard wood on either side ; or if that is impossible, at least one on the left.* Glazed ware is the best material for sinks, and some people prefer a plug and chain instead of just an outlet as usually provided.

The space under the sink is best left open for pots and pails, while above there should be a lining of glazed tiles for a height of 2 ft., so that splashings may be easily removed. Directly over the draining board or sink, space should be provided for a plate-rack, soap dishes, and scrubbing brushes. A cupboard or two, where brooms and dust-pans can be hung and boot-cleaning apparatus stored will be useful, and a good plan is to have a high shelf all round the room, under which sauce-pans pots, and covers may be suspended.

WASH HOUSE

It is rarely possible to provide a separate laundry-room in a detached cottage, though a common one may often be shared among a group of such dwellings with great benefit to the tenants at a very low cost to each. The old-fashioned bricked-in copper is now displaced by the portable all-metal variety, which is a great improvement, being more economical in first cost, space, and fuel consumption. Some architects place the copper in a covered lobby outside the main building, but in this position it has to be very well sheltered to be convenient in winter time. A large hood over the copper and connected with a flue largely overcomes the steam difficulty.

In a wash-house, space for a mangle has sometimes to be provided ; and a useful addition is a flap hinged to the wall, which can be set up for such work as ironing.

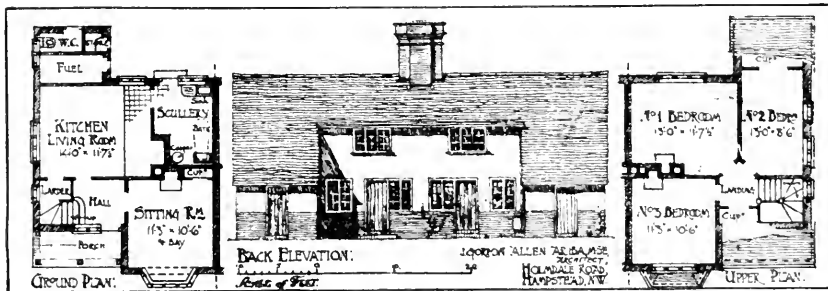
* The ordinary person uses the right hand to do the washing and wiping, while with the left, each article is picked up, handled, and finally put down.

LARDER, STORE ROOM, AND CUPBOARDS

Like the scullery and wash-house, larders should always face the north, and every possible means must be adopted to keep them cool, dry, and well ventilated. The importance of storing food in hygienic surroundings does not need emphasising, and it is easy to obtain a good supply of air by the use of air-bricks and perforated zinc or copper-wire gauze in the windows. A larder should never open out of the kitchen, but may be entered from the scullery, or better still from a passage or lobby. Slate, stone, or marble shelves are the best, but wooden ones do almost as well, and are very much cheaper ; they should not be less than 12 in. wide ; and a few hooks for meat and game will have to be provided.

No house is either comfortable or complete without adequate cupboard and storing accommodation. More than ever in a country dwelling, which may be some distance away from even the village shop, must the architect pay attention to these matters, if the lady of the house is not to have a real grievance. A pantry is sometimes placed between the dining-room and kitchen as a servery, and is useful for the general stores, as well as for china, glass, and silver. Some sort of store-room should never be omitted ; it need not be large, but should be as light, dry, and well ventilated as possible. It is generally more convenient for the larder and store-room doors to open outwards rather than inwards, in order that all the floor space may be utilised.

The absence of cupboards has been stated to be the most lamentable feature in English domestic architecture, and it must be admitted that in some cases even when cupboards have been provided, they are too small to be of much practical use. Most kitchens require at least two good cupboards. If every bedroom were fitted with one



FIGS. 27 AND 28.—£550 is the cost of building this pair of cottages. The elevations have a plinth of red brick up to cill level, with smooth plaster on common brick above, and the roof is tiled. An economical and eye-pleasant feature is the bold chimney stack, into which all the flues are collected. Three bedrooms, with good box and lumber space, are provided on the first floor; downstairs is a large living-room, a sitting-room, and a scullery, which contains a "tip-up" bath placed near the range, copper, and sink to economise in pipes and heat.

large cupboard, perhaps that cumbersome piece of furniture, the wardrobe, would no longer be required.

COAL CELLAR AND OUTBUILDINGS

It is well to have ample space for storing coal and other fuel, especially in remote districts. With a large coal cellar one can take advantage of low summer prices, and be quite independent of temporarily inflated figures caused by increased demand or strikes; and it is sometimes possible to obtain truck loads containing eight or nine tons of coal from retailers or direct from the collieries at a cheap rate.

In calculating the size of the cellar, allow 45 cub. ft. of storage for every ton of coal. It should not be stacked more than about 5 ft. high unless special provision is made. The coal-house door should open outwards, and not into the house but directly into the open air; and it is well for there to be a 2-in. step down into the cellar to keep back coal dust.

Wherever possible, all offices should be included under the main roof, as this effects a large saving in materials, besides having other advantages. When outbuildings are extensive, especially in a row of cottages, the light to and the view from the back rooms may be seriously curtailed, and there is often a lack of convenience and privacy. Water-closets must always be entered from the open air or from a lobby, and never open out of the scullery.

Covered ways or outside shelters, if properly planned, are of great value in helping the work and tidiness of the cottage. They can give access to the coals or w.c., and perhaps the larder. As a suitable place for a bench for knife and boot cleaning, and where the tubs and garden tools can be screened off when not in use, such an open air lobby is a very great boon indeed.

BEDROOMS

Considering the proportion of one's existence that is spent in bedrooms it is surprising what little attention is sometimes given to their planning. Of course, the bed is the dominating factor to be considered when designing a sleeping room, and it is best to show it on the plans. It is 6 ft. 6 in. long and 4 ft. 6 in. wide when double, and 3 ft. wide when single ; but single beds are not often used by the working classes, so the larger beds should be allowed for. If the bed is placed lengthways along a wall, it will have to be moved daily to the detriment of both floor and the temper of those who make it.

One of the best arrangements is to locate the bed behind the door, the fireplace in the wall that is parallel with the length of the bed, and the windows opposite the head of the bed. If a side light is required for reading in bed or other reasons, and a small window is insufficient or impossible to arrange, the fireplace can be placed opposite the wall with the bed and door, and the windows situated in the other wall farthest from the door. It is better to keep fireplaces towards the corners of small rooms so that there will be more space for wardrobes and washstands. A dressing-table must be near a window—right inside a bay-window is not unsuitable—and sometimes a wide window-board can take the place of this piece of furniture.

It will not be practicable to give all the bedrooms the most desirable aspect, though a certain amount of sunshine during some part of the day can and should be contrived for every room. Early risers will choose an eastern outlook for their bedrooms in order to enjoy the morning sun when getting up. Perhaps the south-east side of the cottage is the best of all for a bedroom, as this situation is pleasant and cheerful in the morning with plenty of sunshine. And a south-west aspect is the worst, for the evening sun makes

the room hot and stuffy just when it should be fresh and cool.

A ventilation flue is required by all sanitary authorities in bedrooms which have no fireplace, but the latter should be provided where possible. The required ventilation is also given by building in airbricks near the top of the room, or by fixing a "hit and miss" wooden adjuster with an outlet in the ceiling; but it must be seen that they do not get plastered over. Bedrooms should not have less than about 350 cub. ft. of space for each adult, 200 cub. ft. for each child under ten years of age, and an allowance for each piece of furniture.

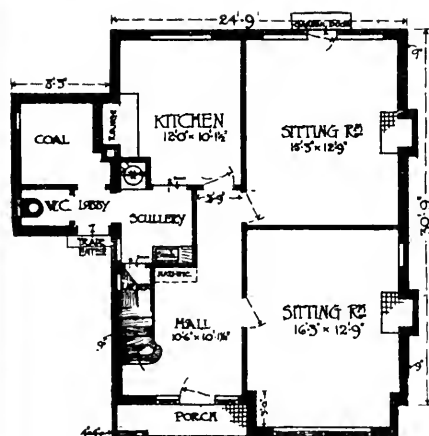
ATTICS

Rooms in the roof provide what are considered by some to be as attractive as any in a house, and in many modern and old cottages, all the upstairs accommodation is contained wholly or partly in the roof. When this is so, a great economy in the cost of the building is effected, for timber framing is a good deal cheaper than brick or stone walls. Some care, however, must be taken to lay the tiles or slates on non-conducting materials (such as boarding and felt) with a good air space between them, or otherwise these roof-rooms will be hot in summer and cold in winter.

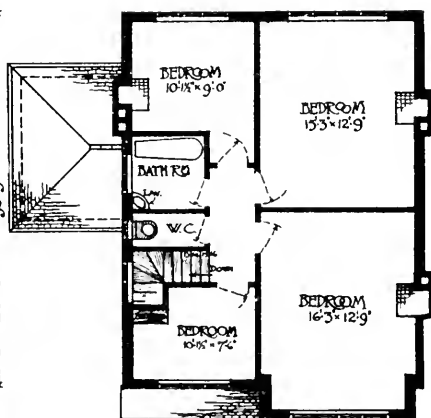
Despite low sloping ceilings, the floor space is of much value for furniture and boxes, and we can place the head of a bed where the height above the floor is only 4 ft., without there being any danger of bumped heads. Internal chimneys are advocated elsewhere in this book, and their value will be found more apparent than ever when scheming attics. Even where there is a fireplace, it is well to provide other means of ventilation besides windows, for all the warm air of the house will find its way up here.

HOUSES AT WEMBLEY PARK RESIDENTIAL WHITE CITY

J. GORDON-ALLIN ARCHT. CT. DASHMONDEN ROAD, W. HAM, ST. LEONARD'S



GROUND PLAN:



BEDROOM PLAN:

FIG. 29 AND 30.—During the last three years a large number of these dwellings have been erected at Wembley at a cost of under £500 each. The plans are practically all alike, being economically arranged, but the elevations have been varied a good deal to avoid monotony. There are four bedrooms upstairs, and, on the ground floor, two large sitting-rooms, a good hall, and the usual offices. Materials: Brick and roughcast, the roof being tiled. The houses were built for sale, and have been sold.

BATHROOMS, LAVATORIES, AND WATER-CLOSETS

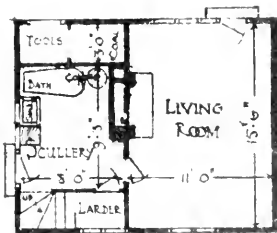
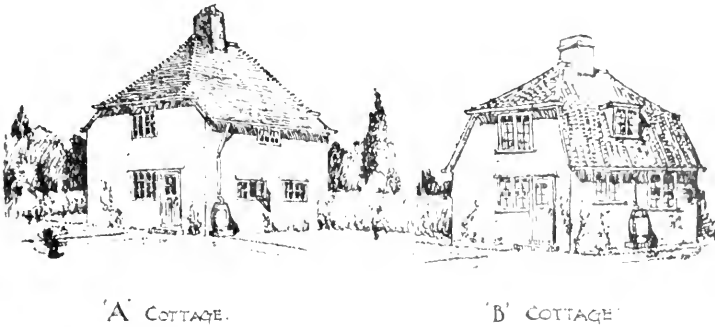
A bath is now considered to be a necessity in every home. Thanks to "tip-up" and other patent baths, which can be fitted in the scullery and folded up when not in use the cost of convenient bathing facilities is not prohibitive in the smallest of cottages. Some of these baths have covers made in the form of a draining board, which is useful for standing on after stepping out of the bath, and at other times, makes a convenient table.

Wherever the bath is situated—and, of course, a position upstairs has advantages—it must be within easy reach of the hot-water fittings from the range, thereby ensuring a simple and effective hot-water supply. If there is a hot-water cylinder or tank, we can use its heat to keep our linen dry and aired in a linen closet; or an extra turn in the hot pipes will answer the same purpose, and also make an excellent towel rail. An important point is to arrange the bathroom on the south-east side of the house, so that the room will be full of sunshine in the morning just when it is wanted.

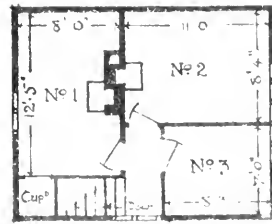
A lavatory basin, too, has become a necessity to most of us in our bathrooms; when choosing it, make sure that the soap dishes are properly drained, for few things are more annoying than to find the soap always in a jelly like condition.

There are two chief considerations to be thought of when planning lavatories and w.c.'s. The first is that all sanitary fittings should be near each other for the sake of economy in the drainage; and the other that all entrances should be screened for the sake of privacy in use. Generally, all earth and water-closets in small cottages should be entered from the open air. Larger dwellings often have on the ground floor an additional w.c. and a lavatory, which is of convenience after games or gardening,

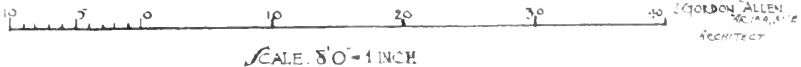
and which saves much wear and tear of carpets, and extra work. If the bath waste is placed at the highest point of the drainage system, its discharge is extremely valuable as a drain-flush.



GROUND PLAN.



BEDROOM PLAN.



FIGS. 31 AND 32.—These small cottages were designed to be suitable for agricultural labourers, and yet to pay interest on their outlay. Cheapness was therefore the main consideration, and for this the materials to be used should vary with the locality and its by-laws. Under favourable circumstances, and providing several were built with standardised fittings, perhaps with hollow walls of concrete blocks, the cost of each cottage should not exceed £105 to £110. "B" cottage has a mansard roof, to save the expense of walling, and it also is shown with the roof covered with pantiles, while both dwellings have central chimney stacks, which are essential for cheap construction. The accommodation includes three bedrooms, a good-sized living-room, and a scullery.

CHAPTER V

THE EXTERIOR : HOW TO DESIGN ECONOMICALLY

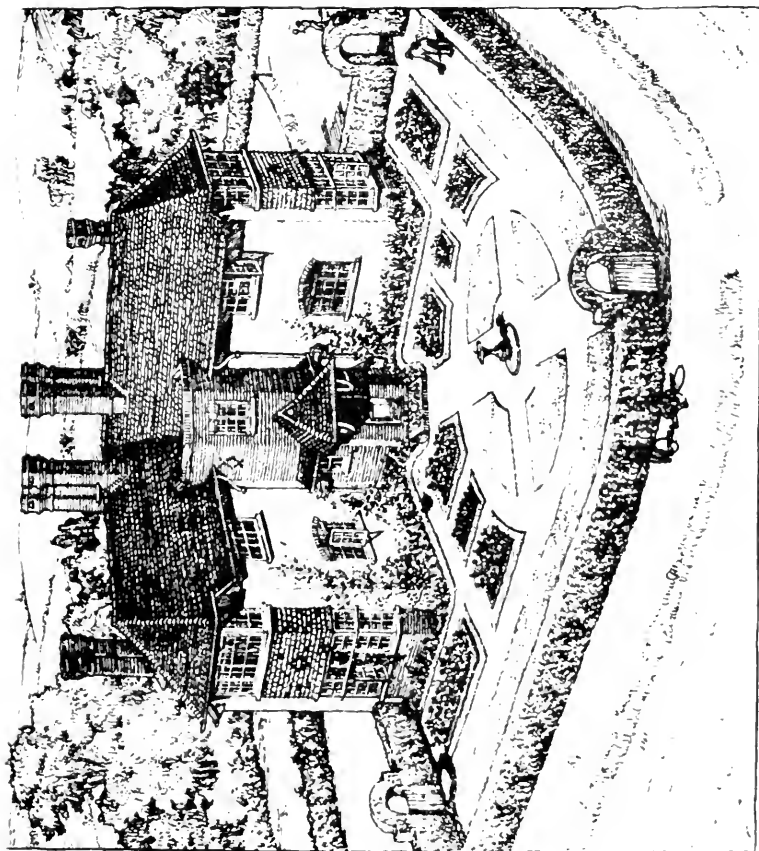
PLANS AND ELEVATIONS

ALTHOUGH for the sake of convenience the subject matter contained in this chapter has been kept separate from that in the preceding one, in reality the actual plan and elevation of any worthy building are so intimately connected that they cannot be treated independently. If economy, convenience, and beauty are to be found in our cottage, the exterior must be a direct and straightforward outcome of the internal requirements. There should always be an entire absence of applied ornamentation—that is to say, features introduced solely for effect—for lasting pleasure is never given by this means. If decoration is required, though it may safely be avoided by cottage-builders, let it arise directly out of the construction.

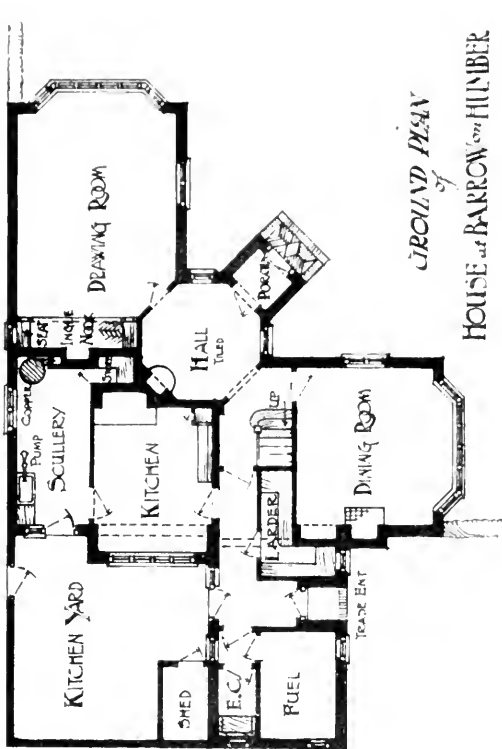
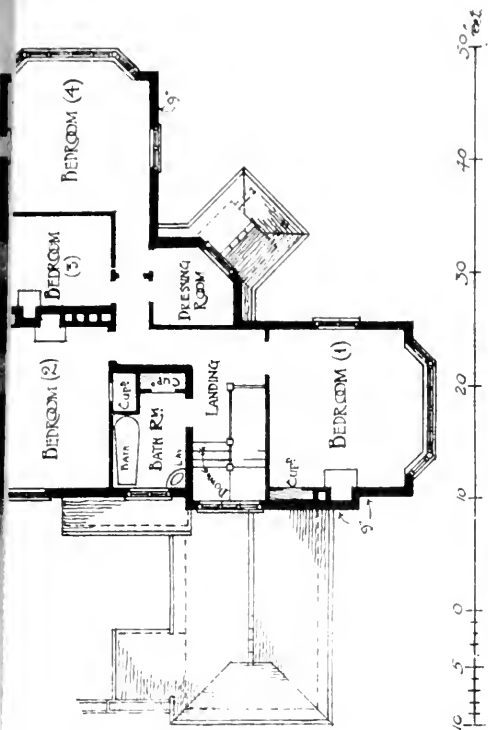
Picturesqueness comes in a great measure from simplicity of form and careful (though in some cases apparently careless) disposition of windows, doors, and chimneys. If the main outline is bad, no amount of ornament—however elaborate it may be—will hide the excessive ugliness of the design ; just as the best colouring fails to convert an indifferent drawing into a good picture.

BEAUTY AND ECONOMY

In the building of cottages, where cost has always been an essential consideration, it may well be argued that the



FIGS. 33 AND 34.—The lowest tender received for the erection of this house, near Barrow-on-Humber, was £800, exclusive of the cost of an artesian well. The aspects and prospects, as well as the fact that the site stands at the junction of four roads, all helped to determine the planning. A large dining-room with an angle-nook was the chief requirement, and a feature has been made, externally as well as inside, of the octagonal hall, which contains a fireplace. Good offices have been provided, and upstairs there are four bedrooms, a dressingroom, bathroom, and a number of cupboards. As the position is exposed to driving winds, the exterior walls were protected with roughcast and tile-hanging. See also Fig. 102.



JOHN L. PEARCE
of
HOUSE at BARROW-on-HUMBER

very qualities that make for cheapness tend towards a pleasing appearance. It is quite a mistaken idea that crude and ugly buildings are necessarily cheaper than those of an artistic character. Repose and homely simplicity, and the application of thought and good taste to produce graceful balance and pleasant grouping—these are some of the elements helping to harmonise the cottage-home with its site and environment without adding to the money expenditure. The charm of English domestic architecture owes nothing whatever to richness of material or fussy ornamentation, which ill accord with surroundings of hedgerow and coppice.

LOCAL MATERIALS

Let us examine some of our historical cottages, and see if we can discover by analysis whence comes their charm. Of course, we shall find it impossible to copy them for we must design our homes in a modern way to reflect our present day needs and habits.

The old builders made direct for comfort and convenience, as they then regarded it, without troubling overmuch about ornament. In all cases they were compelled by force of circumstances to use only the materials most readily available. That in itself gave the work a tranquil feeling of repose, for it was almost impossible for the local materials to be out of keeping with their surroundings. In this way characteristic styles sprang up in various parts of the country—stone-built houses in the Gloucester Wolds, brick walls and tile-hung gables in Kent and Surrey, half-timber work where wood was plentiful, and so on.

There is an obvious lesson for us here when considering our new home. We can learn something about cost as well as materials, though the former is not now so apparent as it was before the days of cheap transit. However, materials at hand are nearly always the least expensive,

for cartage is still a heavy item in the cost of building. If the temptations to use "foreign" materials are too great, we must be very careful not to offend nature, and perhaps our neighbours, by too violent a contrast with the methods and type of work common to the locality. Bright red bricks have a distinctly vulgar appearance in a stone neighbourhood, and Westmorland green slates—a charming material in itself—employed in Kent, Sussex, or other clay localities, are just as jarring and out-of-place as are red tiles in the Lake District.

GROUPING

Repose, also, can only be obtained where the grouping of the building takes into account the exigences of the site. Much can be done by emphasising its good qualities, and disguising, as far as possible, the bad ones. A dwelling in the country, having no "back" and being seen from all sides, must be interesting and presentable from every point of view.

If our site slopes, let the building have a strong vertical treatment; it will then contrast well with the uneven ground and bring out to the best advantage the stability of the walls. A long sloping roof is just the thing for a flat plot of land. Perhaps the site is narrow, with the neighbours' houses lined up correctly on either side; but that is no reason why our cottage should toe the building line as well, especially as it may mean that most of the garden will be sunless in the shadow of the house. And we shall always plead for the lives of the tree or two on the place, unless there is some very good reason indeed.

ELEVATIONS

It is, of course, impossible to lay down a number of rules as to architectural composition, but it may be useful

to remember a few of the most common errors in houses erected during recent years. The most usual mistake is the absence of "breadth" and character, caused by the introduction of too many features, too many sorts of material, and too much detail.

One material should always predominate; and every "quaint bit" or change of material, and each piece of ornament requires its existence to be justified if it is to look well. Simplicity and an effect of strength are essentials in cottage work. And bay windows and other excrescences from the main building do not add to these, though they certainly do to the cost. A most restless appearance is given to elevations, where many materials are employed; one only for the walls and one for the roof will give sufficient variety, provided they are chosen with care. If we are going in for, say, roughcast, let all the external walls be covered with it, excepting only perhaps the plinth. Every bit of repose will be lost if there is a tile-hung gable here, a patch of red brickwork there, and a stone porch round the corner.

SQUARE BUILDING THE CHEAPEST

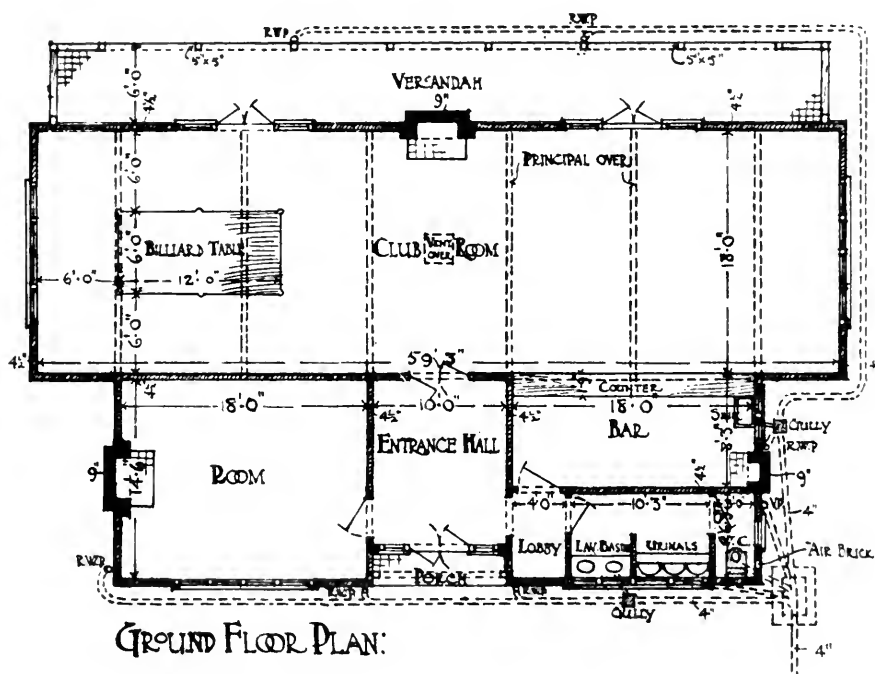
If strict economy must be borne in mind, we shall keep the building within absolutely rectilinear lines, for every break and departure from this form means additional expenditure. A more or less square shape, besides containing the largest area for the same amount of wall space,* allows of a simple roof. A plain roof is one of the cheapest items a cottage can have, and it is also the prettiest and

* For illustration take two buildings each covering 1,600 sq. ft. of floor space—one being 40 ft. by 40 ft., and the other an oblong, 80 ft. by 20 ft. If they are 20 ft. high, the area of exterior brickwork in the square house is 3,200 sq. ft., while that in the other is 4,000 sq. ft. This gives a difference of 800 sq. ft. of walling, which is well worth saving, especially as the houses are of the same size internally.



SKETCH from EAST:

J. GORDON ALLEN



FIGS. 35 AND 36.—These premises were designed in 1911 for the use of a workmen's club in the North of England. Of the accommodation provided, the large club room is for meetings as well as billiards and refreshments; and the veranda at the back of the building is for sheltering spectators of bowling matches. All walls are timber-framed, plastered on the inside and rough-casted externally, the lathing throughout being of expanded metal. The floors are of patent jointless composition on cement concrete, and all woodwork is treated with a preserving stain instead of being painted. The ventilation turret is covered with lead, and patent asbestos tiling is used on the roofs. Cost: £400.

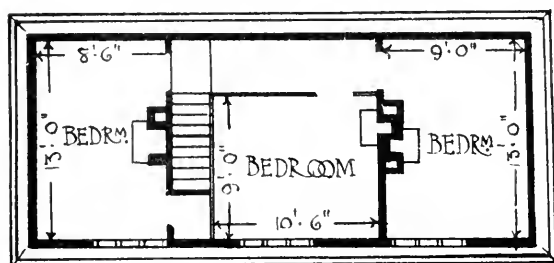
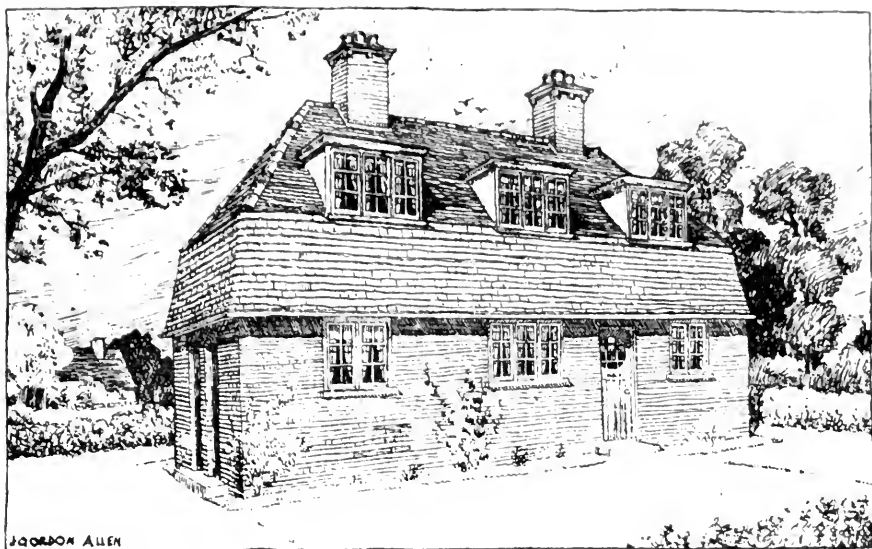
most dignified. The amount of passages a square plan requires is very small.

It is not enough for the walls to be strong, they must look strong too. They should be set out in as long unbroken lines as possible, with necessary wings and projections always meeting at right angles ; and the plainer the wall treatment the cheaper the scheme. A large amount of exposed woodwork should be avoided as being expensive in upkeep, but we shall always insist on wide projecting eaves, because they protect the walls from wet, and cast a shadow, which adds much to external appearances.

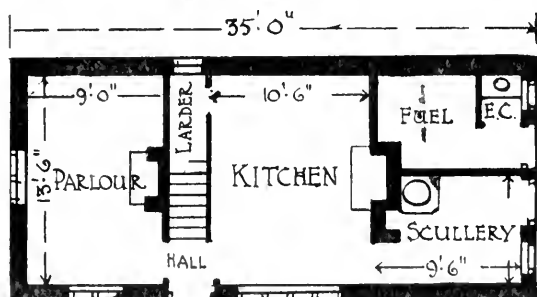
ECONOMY OF LOW BUILDINGS

About 40 per cent. of the cost of an ordinary cottage is spent on walling material, and a legitimate means of economising in this direction is by reducing the height of the building to a minimum. This can be done without taking away anything from the floor space, which is so essential. The height of rooms is, therefore, a most important matter. High ceilings add very considerably to the expense, without necessarily making the rooms more conducive to health, for tall windows and other means of ventilation may always be employed. 8 ft. 6 in. or 8 ft. 3 in. from floor to ceiling is high enough for any room in a dwelling-house, and some authorities think 8 ft., and even less, quite sufficient.

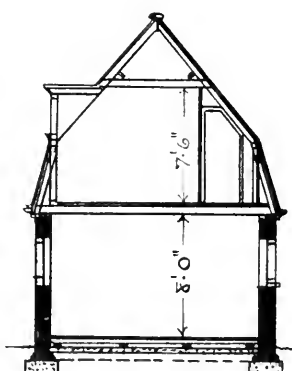
The first floor rooms in a cheap cottage will always be more or less in the roof. By this means much brickwork is saved, and occasionally another room or two can be arranged above, wholly in the roof, without much additional cost. Often, however, the expense of stairs, raising the roof, and strengthening the ceiling joists do not make it worth while ; in which case the space may be used as a lumber-room, and be entered from a trap door.



BEDROOM PLAN.



GROUND PLAN.



SECTION.

FIGS. 37 AND 38.—This type of cottage—first designed by Mr. Clough—is a most economical one. As will be seen from the sectional drawing above, there is no brickwork in the walls above the ground floor ceiling, the three bedrooms being in a tiled roof of mansard form. In this way the interference of by-laws with timber framing is defeated. The accommodation consists of a kitchen, 13 ft. 6 in. by 10 ft. 6 in., with a cupboard and large larder under the stairs; parlour, 13 ft. 6 in. by 9 ft. 6 in.; scullery, 10 ft. by 7 ft.; and an earth closet and large fuel space. In many cottages of this size, both the parlour and the stairs open out of the kitchen, but it is much better if they can adjoin the hall or lobby, as in this case, for often a bedroom, and occasionally the parlour, is sub-let. Each of the three bedrooms is provided with a fireplace and a cupboard. The cost should not exceed £160.

Besides saving money by keeping the height of the building down, we shall avoid that ugly high effect which was the fashion in early Victorian times. If the eaves are kept low, and other horizontal lines emphasised, the result will be the most pleasing cottage-like proportion—a long, low, and spreading appearance.

CHEAP ROOF CONSTRUCTION

The most economical feature in a country cottage is a plain roof. To obtain it will be well worth a few sacrifices in other directions, for a simple and unbroken roof of good proportion has a deal more beauty than any number of elaborate gables, and expensive hips and valleys. Nothing should be allowed to complicate the roof construction. On account of cheapness (and incidently a reposeful effect), the eaves gutters and the wall-plate, where rafters meet wall, should be continuous and uninterrupted by window heads, which must be as low down as possible.

Dormer and half-dormer windows in the roof necessitate considerable extra labour in the cutting of roof-timbers, etc., and require the use of that expensive material, lead, for the valleys, flashings, and, in the case of flat dormers, roofs.

Figs. 7, 31 and 72 show how the upper floor of a cottage may be treated as a Mansard or curb roof. This is of course a very cheap arrangement, as the bedroom walls are not of “brick or stone” but of timber-framing. These dwellings are economical and comfortable and possess excellent accommodation, and the design defeats the interference of by-laws with timber construction.

ONE STOREY *versus* TWO.

The bungalow type of cottage costs more than a two-floor dwelling of the same accommodation. Three floors

are also not economical, as they require thicker walls on the ground floor. A cottage of two storeys occupies only half the ground required in the one-floor arrangement; it halves the amount of required excavation, concrete foundations under floors and walls, roofing materials and gutters; and effects an appreciable saving in walling materials despite the extra height of the walls. It has been argued that the stairs and landings are saved in one-floor cottages, but as the space under and over may be utilised to a certain extent, the economy is small, and is balanced by the extra cost of chimney-stacks, which have to be more numerous although lower. As far as passages and flooring are concerned, the cost is slightly in favour of the ordinary cottage of two floors.

Figs. 3 and 41 illustrate two cheap bungalows, in which the accommodation is grouped around the main living-room, thus obviating the need of passage-ways, which of course is a great saving in the cost. Where possible, however, it is far preferable to provide separate means of communication between bedrooms and sitting-rooms as is done in Fig. 40. Someone recently pointed out that where all the rooms are on one floor the servant problem is solved to a certain extent, since it is possible for a woman to perform unaided, and without undue fatigue, all the household duties that would require the employment of at least one servant in an ordinary dwelling of two or more storeys. Anyway, it is usually admitted that housekeeping work is simplified.

As regards appearance, we have already remarked that the lower a cottage is, and the more spreading its lines, the more suitable will the structure look among rustic surroundings. But still, these pleasing effects can be obtained equally well in a cottage with good accommodation in the roof. If it is to be more convenient and cosy than a

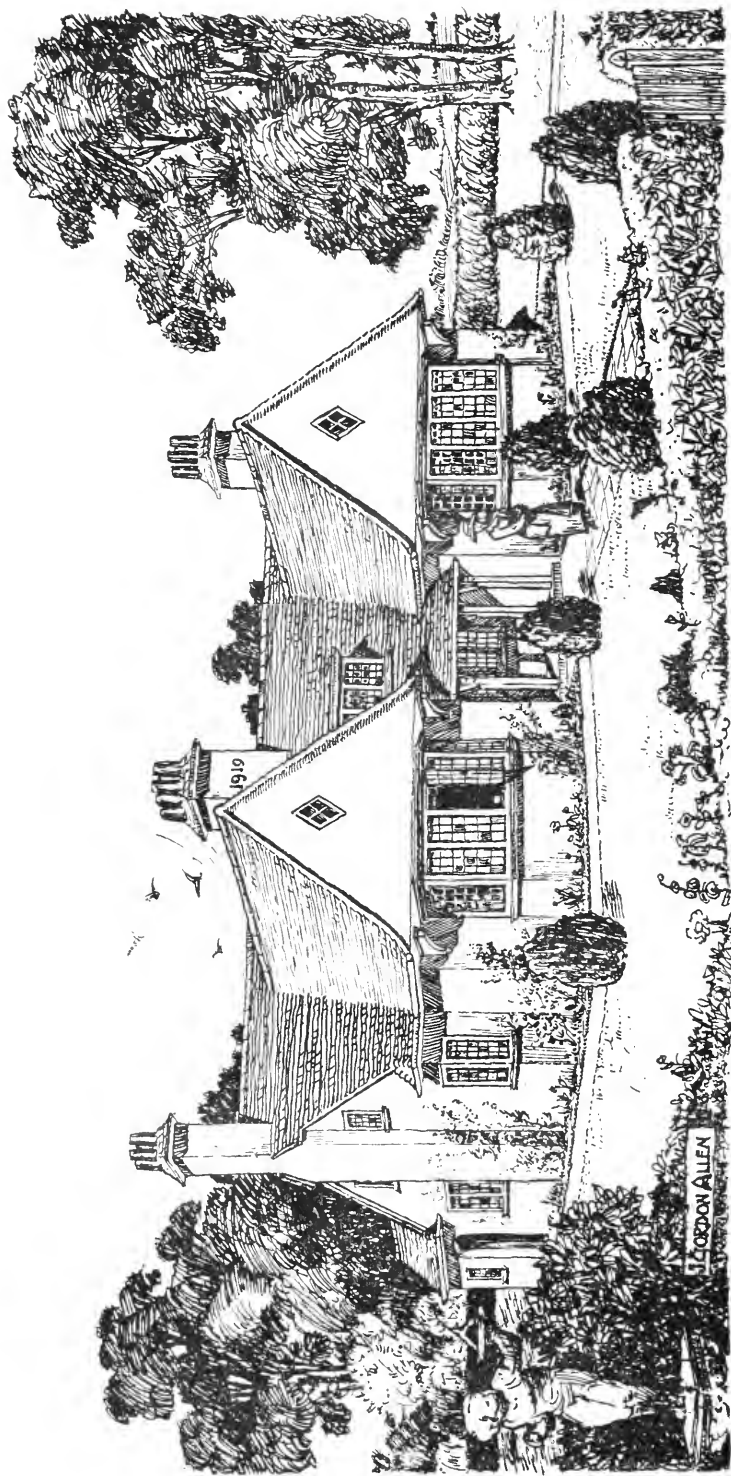
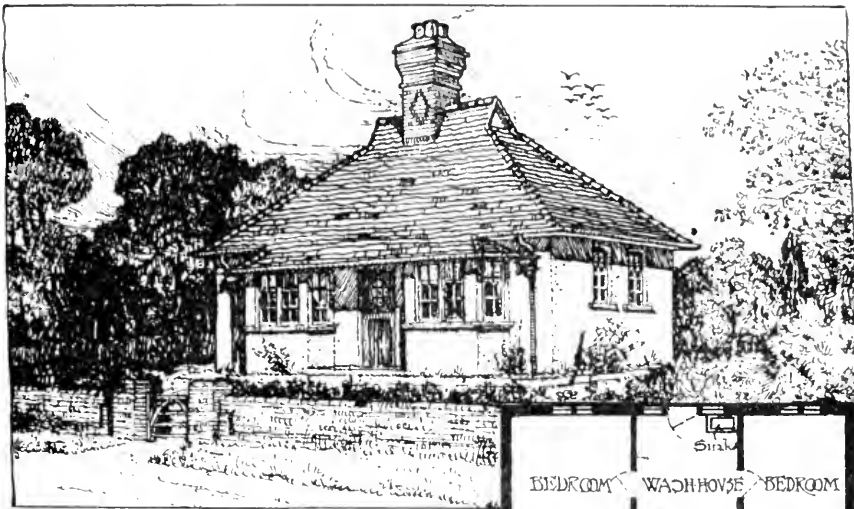
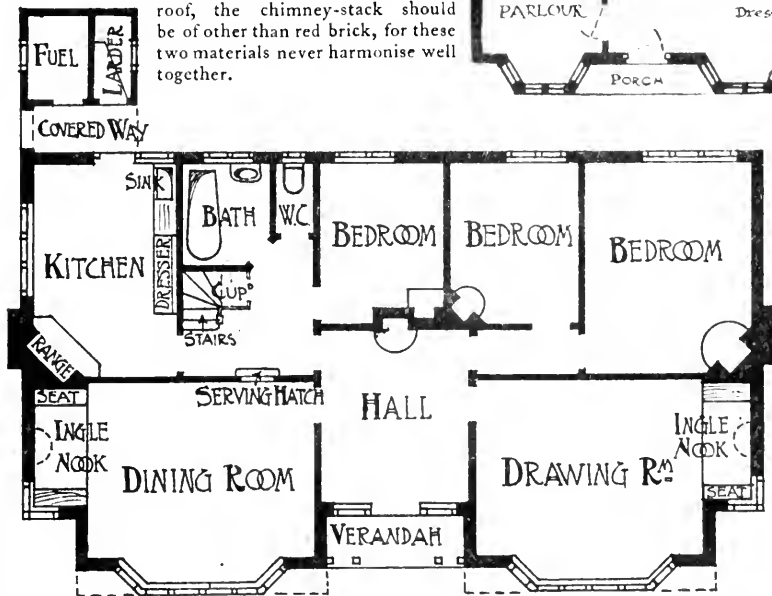
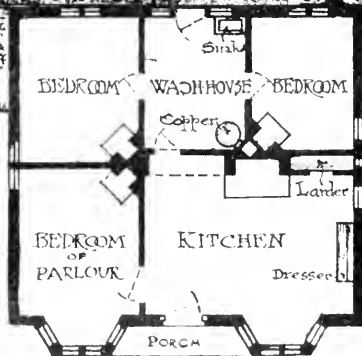


FIG. 39.—This bungalow—if it may be so called, there being considerable accommodation on the first floor in the roof—was built in Wales and Sussex in 1911. at a cost of £650 to £700. The plans are shown and described on the opposite page. All exterior walls are of brick and roughcast, with a tarred plinth to prevent damp from rising up the walls, and the roof and chimney tops are tiled. Most of the windows have leaded-light casements with iron frames,



FIGS. 41 AND 42.—This plan and sketch show a £150 bungalow cottage containing three bedrooms, a large living-room, and a washhouse. The materials used should vary with the neighbourhood: in this case they are bricks, roughcast, and tiles. If blue slates were used on the roof, the chimney-stack should be of other than red brick, for these two materials never harmonise well together.



GROUND FLOOR PLAN:

3 BEDROOMS, BATH,
CUPBDS, ETC. UPSTAIRS.

FIG. 40.—This plan is of the bungalow shown in Fig. 39 on the opposite page. It will be seen that both the dining- and drawing-rooms contain an ingle-nook fire-place with seats, and the hall is of good size, and has a fireplace. Of the six bedrooms, three are on the ground floor, where there are good offices, and no bedroom opens out of the hall.

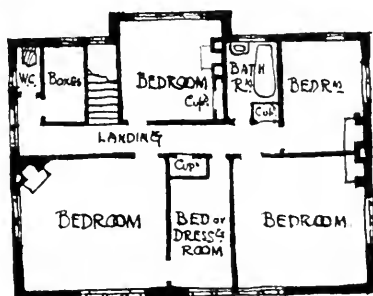
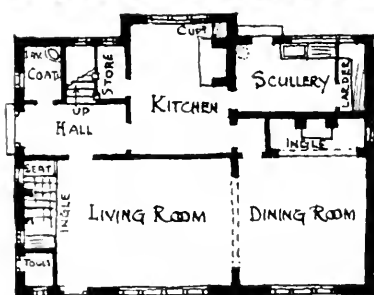
two-storey dwelling, a bungalow requires very careful planning, especially in the direction of privacy, and well-ventilated and light passages. It is thought that bedrooms are somewhat healthier when above the ground storey, and many people prefer to go upstairs to their sleeping places—an idea possibly inherited from our supposed ancestry!

FIREPLACES AND CHIMNEY STACKS

The planning of the rooms so that the fire-places form one or two large central stacks, not only tends to economy in heat, materials and labour, but also greatly increases the possibility of artistic effect. Nothing looks worse than a number of small spidery chimney stacks, and they always look happier exteriorly and are more satisfactory inside, when situated in the ridge. Chimney-openings on outside walls are best avoided, though where cheapness is not the chief object, charming effects may be produced inside the cottage and out if the inglenook is of generous build.

A stack of chimneys should be bold and solid so as to aid the skyline, which makes all the difference in the appearance of a cottage-home. Especially when viewed from a distance, the silhouette of the chimney stacks and the roof sums up practically the whole effect. Flues 9-in. square are sufficient in area for all ordinary fireplaces, and it is better to encase them with 9-in. walls to give them strength against wind pressure and driving rains, and to prevent the fires from smoking and the stacks from looking thin and spidery. When the latter are less than 1 ft. 10½ in. wide, they have a weak appearance.

Chimneys that do not draw properly are often remedied by increasing their height. Especially should they be high when near trees or other buildings; and it must also be remembered that stacks look much lower in execution



FIGS. 43 AND 44.—The country cottage shown here by plans and a view was designed to meet special requirements. What was required was a large unobstructed apartment—which can be divided into two portions when required—on the sunny side of the house. Each of these divisions contains an inglenook. A lavatory and a cloakroom is provided near the front door, and running from end to end of the roof is a large lumber-room, which may be adapted into a playroom later on. On the first floor are four bedrooms and a dressing-room, bathroom, box-room, etc. The materials used are local tiles and bricks, the latter being whitewashed for the sake of weather resistance and appearance. Cost : £450.

than on a geometrical drawing. No unnecessary ornament or moulding should be allowed to take away from their sturdiness, while chimney pots, if used, are better quite plain and unobtrusive. Generally, brickwork is the most suitable material for chimney stacks, and looks better and stronger than roughcast in this position.

SASH WINDOWS AND CASEMENTS

Being specially suited for use in long, low, horizontal proportions with an informal treatment, casement windows are well adapted for cottage work. Double-hung sash windows, on the other hand, require regular grouping, and must be tall and narrow to be well-proportioned.

For convenience in use, simplicity in construction, and cheapness, the arguments are mostly in favour of casements. They are hung to stone or solid wooden mullions, and if the windows are very high, transoms are used to divide the light into two divisions, though care must be taken not to interfere with the sight line 5 ft. 9 or 10 in. above the floor.

Sashes are made in two parts to slide up and down by means of weights and pulleys, and get out of order easily. Although they can never be opened to more than half the area of the window, they are useful for ventilating a room without draught if a high inner sill-piece has been provided for this purpose. Fig. 46 shows such an arrangement, which allows the lower sash to be slightly raised without exposing the room, and thus admitting fresh air between the meeting rails.

A good width for windows is about 1 ft. 9 in. from centre to centre when casements are used, and not more than 2 ft. 7½ in. for the sash variety. It pays to keep them in as much of a standard size as possible throughout the building, and if the openings are of a brick dimension

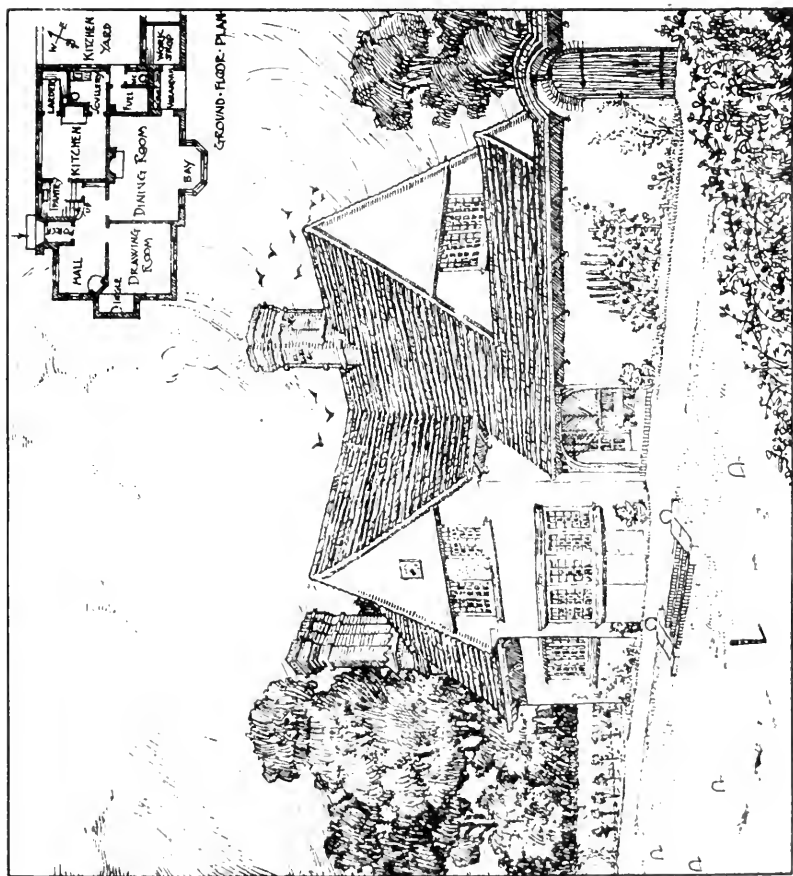


FIG. 45.—This illustration shows a small country house, designed for erection in a well-timbered neighbourhood, and costing £750 to build in a sound manner. It contains a good hall with a fireplace, drawing-room with an angle-nook, and large dining-room giving access to a loggia, from which a small workshop is approached. Five bedrooms are on the first floor, where there are good cupboards, a bathroom, and housemaid's closet.

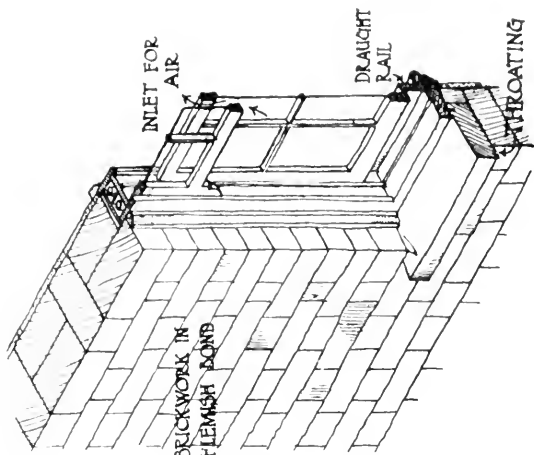


FIG. 46.—As this window has a draught rail fixed to the sill, the lower sash can be slightly raised without exposing the room; in this way fresh air is admitted between the meeting rails, as shown by arrows in the sketch above. Sash windows are described on page 76.

This drawing is also referred to in the chapter on materials, on page 103, as it shows a brick wall built in Flemish bond.

(a multiple of $4\frac{1}{2}$ in.) much expensive cutting of brickwork is saved. In the wall itself the best position for the frame is near the outer face, so that the full strength of the woodwork shows on the outside, and a useful wide window-ledge can be fitted in the room. The thickness of the wall shows internally with this arrangement, and the necessity of an expensive stone sill is obviated, while the oak or other hard wood sill need not be as large as would otherwise be required.

HOW CASEMENTS OPEN

The way casement windows are hung is of importance from three considerations—ventilation of the room, resistance to the weather, and the question of blinds and curtains. When side-hung to open outwards, they are found the most satisfactory. This applies to windows above as well as below the transom: for when those above are made to fall inwards, they interfere with curtains but give efficient ventilation; and the more usual arrangement of hinging the window at the top to push outwards provides indifferent ventilation.

Another advantage of side-hung windows is their simplicity: and even if they are too high to reach without the aid of a stool, the extra trouble is more than repaid by the absence of unsightly and elaborate ropes and rods. The difficulty of cleaning ranges of casements when the number of lights is uneven, can be overcome by letting the centre window open inwards, or by hinging it at the top, or by fixing it with a centre pivot. It is a great advantage to have one of the upper panes opening independently in each room.

FRENCH WINDOWS AND SILL HEIGHTS

Fig. 47 shows some French casements extending to the floor level. They are useful for providing an easy approach

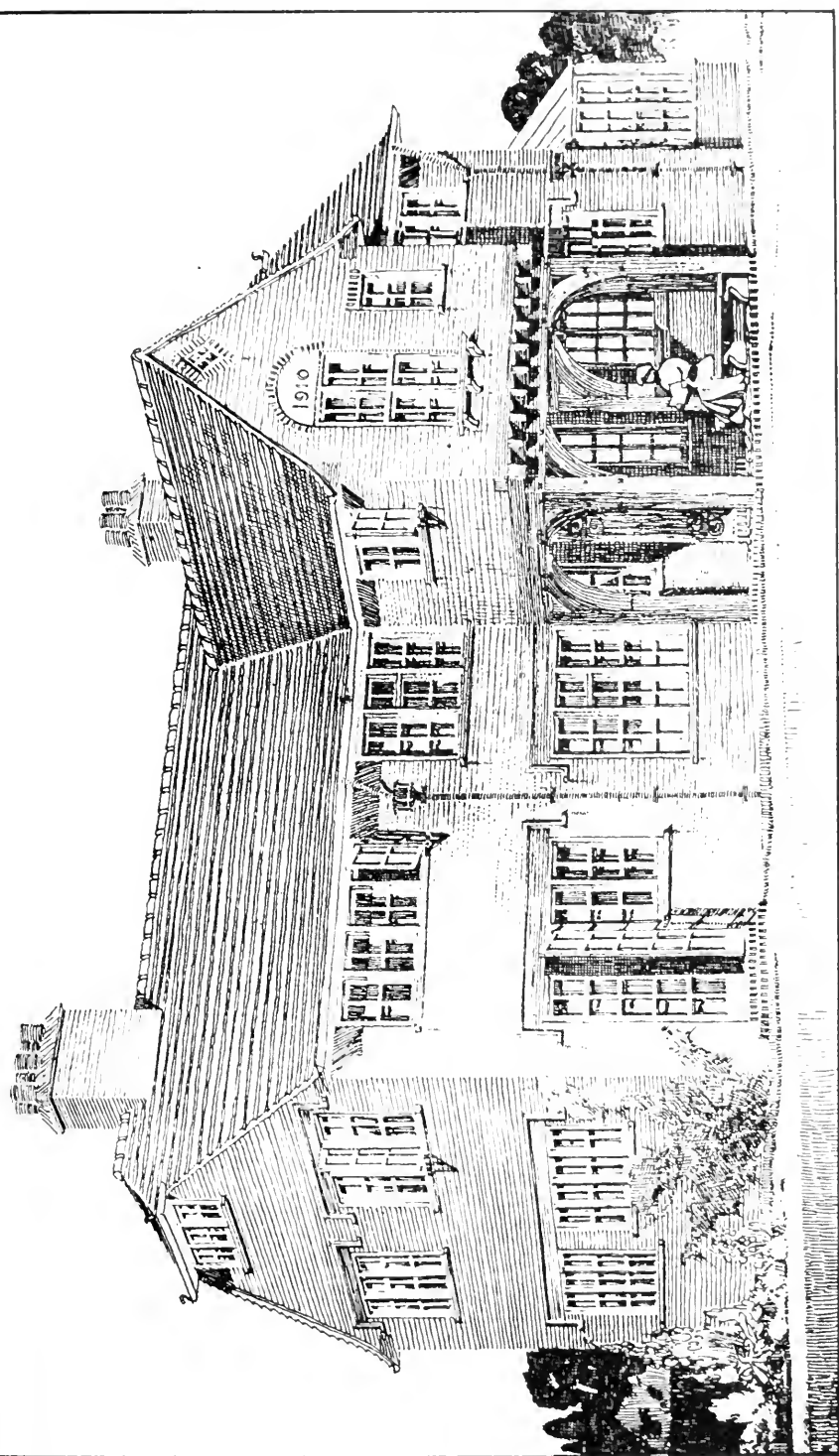


FIG. 47.—The contract price for building this country cottage in Oxfordshire was just under £800 complete, with some small stable outhouses. A quantity of old oak beams was introduced into the design, inside as well as exteriorly, and a feature was made of the porch, over which projects the bathroom. The walls are of whitewashed brick, with a tiled roof.

or good views into the garden ; but, being liable to make the room cold and draughty, they should be used with caution. These windows, in a similar manner to other casements, are more waterproof when opening outwards.

So that anyone seated in an easy chair can look out, the glass line of ground floor windows should not be more than 2 ft. 6 in. from the floor. In bedrooms the sills can be rather higher to secure privacy—a glass line 3 ft. 6 in. high is sufficient for this purpose. At least some of the windows in each room should finish as near the ceiling as possible, in order to ensure ventilation and make the interior bright and cheerful.

PANES OF GLASS *versus* LARGE SHEETS

Most people will admit that windows with well-proportioned divisions help the aesthetic quality of the exterior design and give “scale” to the building. From discussions with clients on the matter, the writer has found that the chief objection to window panes is that the divisional bars interfere with the view and diminish the light. For the sake of more light, then, let there be larger window areas ; but let us add to the picturesque externally, and keep that comfortable feeling of really being inside the room safe, by dividing up the walls of blank sheet glass with bars that do not materially obstruct the view.

Large sheets of glass look dreary and uninteresting, and cost more, both in the first instance and when breakages occur, than smaller window panes. In addition, bars by stiffening the window make it a good deal stronger than it would otherwise be. There is no necessity for the window panes to be other than a reasonable size, for very small ones are a trouble to clean. As far as possible, the openings formed by the bars in the windows should be

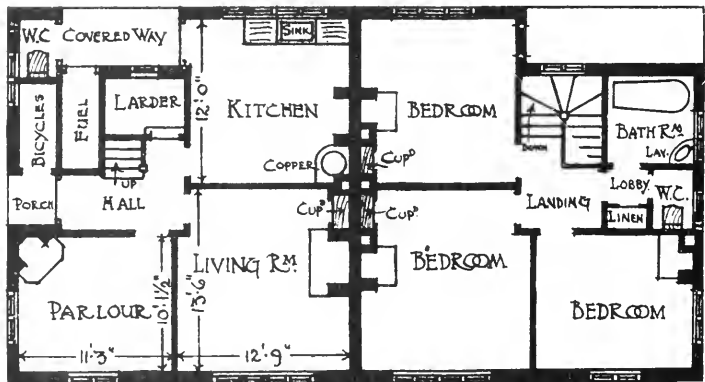
equal on all elevations ; and care must be taken to choose a pleasing size. Square panes are unsatisfactory in appearance ; but a proportion of four in height to three in breadth always looks well.

The arguments in favour and against the use of window bars apply equally well to leaded glazing, which gives delightful effects. Unfortunately, leaded lights are expensive ; and in some country districts it is not an easy matter to find a workman who is able to carry out repairs. Nothing is more troublesome than the cheap kind with narrow comes,* which let water through easily, and soon bend and break. While diamond panes and very small squares are difficult to make and to look through ; large panes measuring about 8 in. high and 6 in. wide with $\frac{5}{8}$ in. comes are both convenient and artistic. Although leaded glass is often used in wooden casements with good effects, it is really far more suitable in iron frames ; but the latter can only be considered when the question of expense is not of primary importance.

SHUTTERS

The question of having louvred or other shutters to the windows will always be left to the discretion of the cottage owner. There is no doubt that they add considerably to the cost ; but they have many advantages, apart from their important decorative character on the exterior of the house. Those who have had actual experience of the effect of external shutters on a room facing south, when closed over open windows on a hot summer's day, will appreciate their cooling result upon the temperature inside. Fig. 13 shows the kind that are useful for protection from the sun's rays. Shutters also afford an additional means of protection to the lower windows in lonely places.

* The comes are the dividing strips of lead.



GROUND FLOOR PLAN.

FIRST FLOOR PLAN.

FIGS. 48 AND 49.—This pair of cottages is of a good square character, with an unassuming but pleasant appearance. The plans show accommodation ample for the needs of many middle-class households, and consisting of three bedrooms, bathroom, etc., upstairs, with a living-room, parlour, kitchen, and the usual offices below. The cost of each house should not exceed £250. Materials: Brick, roughcast, and tiles.

CHAPTER VI

INTERIORS

BAY WINDOWS, VERANDAS, AND BALCONIES

SOME of the prettiest and most comfortable rooms in old cottages have no bay windows, or irregularities of any kind. Although they often add much to the pleasantness and size of a room, and give interest to the design both externally and internally, bay windows require careful treatment in order not to appear as after-thoughts, or to detract from the strength and simple character of a building. There is no doubt that they are comparatively expensive features; and rather than having insignificant and ill-proportioned windows projecting from all sides—as may be seen in some of the newer suburbs—it is better to avoid them altogether.

Verandas or loggias, which have become important adjuncts to the cottage home, also need no little effort on the part of the designer to make them look an integral part of the building. Unless the depth is enough to form a kind of open-air living-room, a veranda is not of much use; and adjoining rooms will be dark and cheerless, unless independent windows are provided. To be of real value and to have a satisfactory appearance, the main roof should continue right over the loggia, no metal abomination will ever be allowed, and a sunny position should be chosen.

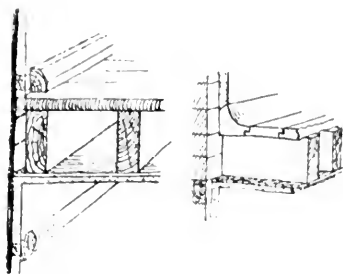
Balconies are sometimes useful, especially when opening off a landing and taking in a good view. But when stretching in front of bedrooms, they may be embarrassing to the occupants. It is well to avoid anything of a brittle construction, and to steer clear of the amazing and uncomfortable-looking fretwood treatment affected by some speculative builders.

UNSEASONED WOODWORK

One of the most troublesome items in a modern cottage is the danger of woodwork splitting, shrinking, and warping. This evil was never greater than it is to-day, for never before has there been so much young and sappy wood on the market. On this account, as well as that of economy in first cost and future upkeep, we shall avoid all unnecessary timber both inside the house and out.

Linings, window-boards, architraves, and mouldings of wood are by no means a necessity on doors and windows, or elsewhere, and deep skirtings are quite superfluous, besides being ugly and expensive. Where window and door frames are on the outer face of the walling, as is usually preferable—a good way is to make them project where roughcast or tile-hanging is employed—it is far more sanitary, and cheaper too, to plaster the deep reveals. The internal sills can very suitably be of brick or tiles, though some people object to the coldness of these materials.

As most of the rooms will have plastered walls, some kind of skirting becomes necessary. The small and plain skirtings do all that is required, and are less dust-catching and expensive, and more in keeping with the cottage than large, heavily-moulded ones. Two varieties of cheap and simple skirtings are shown in Figs. 50 & 51. They keep chairs



FIGS. 50 AND 51.—These sketches show two small skirtings that perform all the duties of the larger and dust-catching kind. The curved skirting illustrated in Fig. 51 is useful as no angles are left for the collection of dirt. These two figures are referred to on page 84.

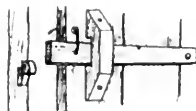


FIG. 52. — This home-made latch is mentioned on page 86. On an old-fashioned ledged door it looks well, and is often preferred to a Norfolk latch of metal.

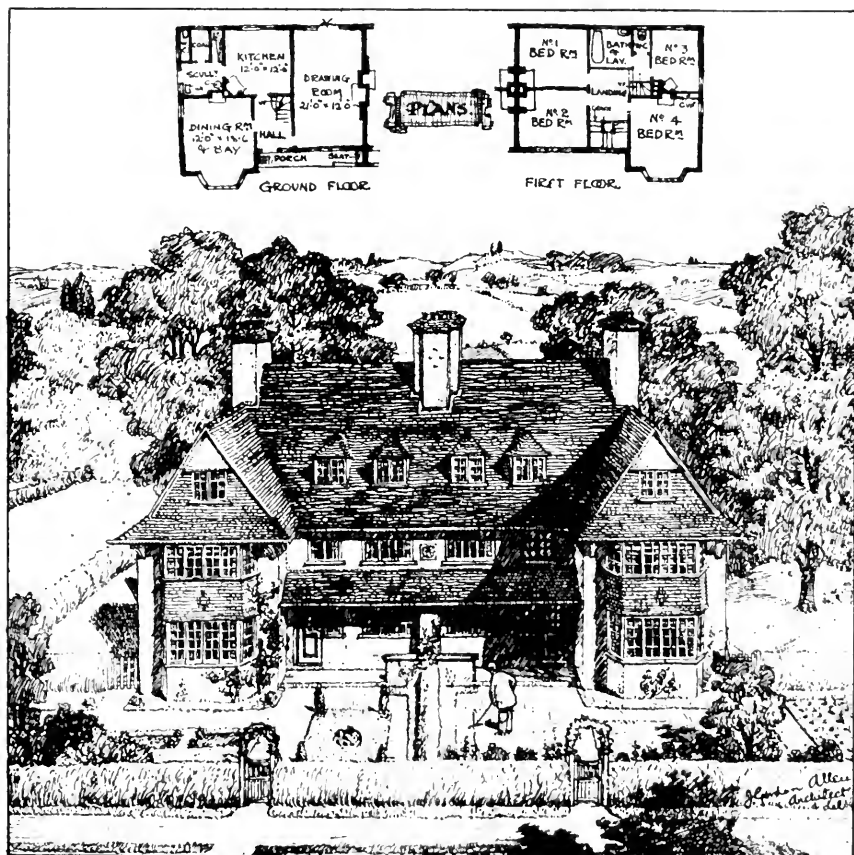


FIG. 53.—Allowing 6d. for each foot in the cubed dimensions, the building price of these semi-detached houses is £600 each. Tiles, bricks, and roughcast are the materials employed. Three of the seven bedrooms are attics, as are also the box- and cistern-rooms, and there is a large drawing-room, dining-room, kitchen, and offices on the ground floor. A seat is provided in the veranda-porch.

and boots from damaging the walls, and leave no space for vermin or the collection of dust.

DOORS.

One of the greatest offenders in the way of splitting is the ordinary four-panelled foreign-made door. The old-fashioned ledged doors, with Norfolk latches, overcome the warped panel difficulty if well made, and look more suitable in cottages with their simple character. Strap hinges look well on these doors, and sometimes home-made latches, as shown in Fig. 52, are preferred. Where it is desired to afford some means of throwing two or more rooms into one large apartment, doors that slide into the thickness of the walls are superior to folding doors, which are a nuisance when open. It should be remembered that as the wood framing is not sound-proof, the loss of some amount of privacy goes to balance other advantages obtained.

A height of 6 ft. 6 in., and 2 ft. 6 in. for the width, is sufficient for any ordinary door, and the lock-rail should be higher than is usual to prevent stooping when turning the handle. Many machine-made doors, especially those from Sweden, are very badly proportioned. If hung upside down, they are more convenient and look better; and elaborate mouldings should be avoided, as the recesses soon become choked with dust. Care must be taken to hinge the door so that it screens the room when opened.

Outside doorways have a hospitable appearance if kept wide and low; 6 ft. 6 in. is quite high enough, although lower than usual; and 3 ft. to 3 ft. 6 in. makes a good width. It is often convenient to have two folding doors—not necessarily equal—as shown in Fig. 58, as they take up much less room when open. All exterior doors should have a small paved space outside. If a paved path

of stone flags can be provided in addition, it will prove more valuable in muddy weather than any number of scrapers, and give a delightful old-world effect.

INTERNAL WALLS

The servant difficulty would be largely solved if all elaborate mouldings, ledges, and other resting places for dust and dirt were banished from the house. Glazed and washable surfaces should be introduced wherever possible, as they can be so easily cleaned; and great care should be exercised to choose materials that are really suitable for their purpose and position, and not readily dirtied or damaged by wear.

It is not advisable to paper new walls, as they take some months to dry thoroughly; but a cool-toned distemper gives an inexpensive and satisfactory surface. There are many good patent distempers on the market, and most of them are sanitary and washable, and can be renewed inexpensively. When it comes to wall-papers, we shall be chary of high colours and intricate patterns, which spoil the appearance and reduce the apparent size of our rooms. Red papers do not suit hot rooms, but warm up north ones charmingly. A striped pattern will increase the apparent height of the walls; while one with any kind of horizontal lines, or checks, will diminish it. If a plain "lining" paper is chosen, the effect will be quiet and homely, and we shall have more money to spend elsewhere.

A picture-rail fixed low down—just above the top of the door is as good a level as any—while costing little, saves the plaster of the wall from being damaged and makes an excellent stop for the wall-paper or distemper below, while the space above it can be whitened just like the ceiling. This arrangement saves a large part of the

cost of wall treatment, and obviates the use of plaster cornices, which are expensive, dust-catching, and often unsightly.

In the kitchen and scullery no wall paper, however sanitary and hard-wearing it may be, is really satisfactory ; and glazed bricks or tiles, even only up to dado level, can rarely be afforded. The next best way is to paint the walls about 4 ft. high from the floor with a hard enamel, as this is grease-proof and non-absorptive ; and a cheaper method still is to use a washable distemper, and renew it every year or two when the ceilings are whitened. The woodwork should be well varnished, so that it may be washed when required.

FLOORS

Solid ground floors have many advantages over the ordinary joisted and boarded variety. They are secure against dry rot, vermin, and dirt ; and save in excavation, walling and sleeper walls. For comfort, the sitting-room floors must be of wood as a rule, and can be of boards with tarred undersides nailed direct on breeze concrete ; or they may be of wood blocks laid in mastic on ordinary concrete. With boards, the seasoning difficulty crops up again ; and frequently, even when properly cramped up, they will shrink and disclose ugly gaps. However, if the boards are laid in narrow widths and perhaps tongued, this evil may be prevented ; and they look quite nice if stained and polished.

As the kitchen must generally be counted as a living-room, for one person at least, a floor of cement or tiles—while being so cheap and suitable for such places as the scullery and larder—will have to give way to something less hard and cold, and fatiguing. There are many jointless floor compositions now sold which are fairly cheap and

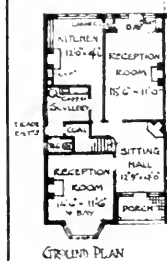
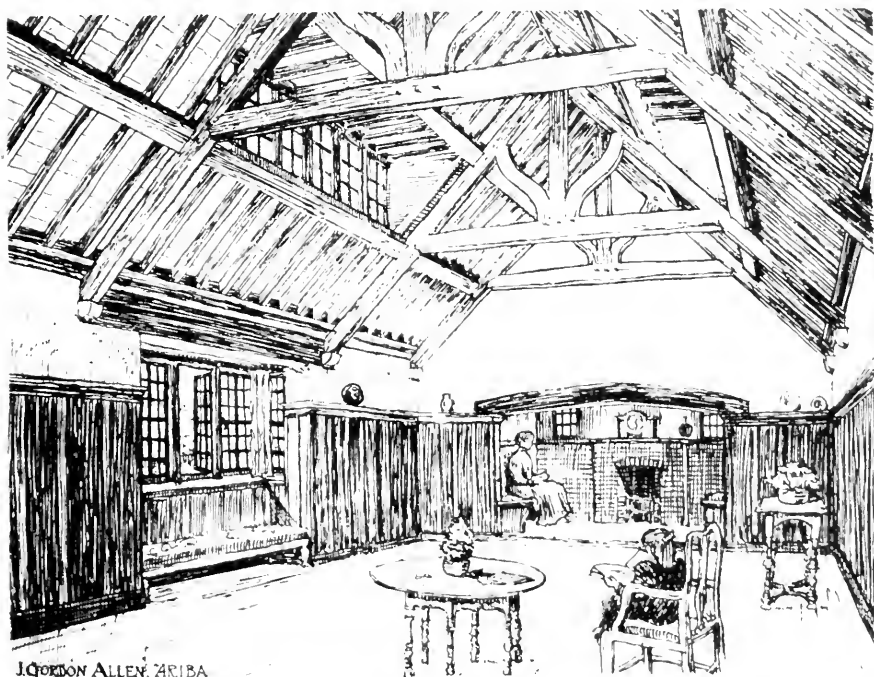
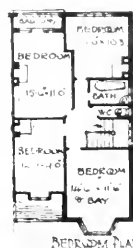


FIG. 54.—A considerable number of these semi-detached houses has been built near Harrow with varied elevations, no two adjoining pairs being similar. The frontages are narrow—only 22 ft. wide—consequently the houses are long. There are three sitting-rooms, counting the hall (which has a fireplace, and measures 12 ft. 6 in. long and 9 ft. wide) as one. Good porches are provided to the houses, and the kitchen obtains direct light from the back. Upstairs are four bedrooms, one of which opens out on a balcony.



J. GORDON ALLEN, ARCHT.

FIG. 55.—A bungalow living-room, large enough to hold a billiard-table, is shown in this sketch. The roof is an open timbered one, with dormer windows, and the wall-panelling is 6 ft. 6 in. high from the floor. There are three fixed seats in this room—one in the bay-window, and two in the angle, which is spanned by an old oak beam.

non-absorbent, and quiet and warm to walk upon. Linoleum or cork carpet finished directly on a concrete surface also makes a satisfactory floor, and effects a great saving in the cost. It looks best when of a plain colour without any pattern, and may take the place of a carpet, though a few rugs may be added if desired.

Large tiles up to 12 in. square give a pleasant appearance almost anywhere; and for porches and verandas we shall find it difficult to improve on brick-on-edge—laid in a “herring-bone” pattern if it pleases us. The artistic person will vote for stone flags, provided they are in random sizes and not too accurately jointed; but in the house nothing will make a colder floor. Much of the charm of brick, tile, or stone paving will be lost if they are laid tight; wide joints, about half-an-inch thick, add immensely to the interest of these floors, showing up each member as a separate piece of construction.

CEILINGS AND UPPER FLOORS

A plain plaster treatment is generally as cheap and as satisfactory as anything for ceilings, and moulded cornices should be avoided, since they form dust traps and are expensive.

The ordinary lath-and-plaster ceiling may often be omitted, leaving the floor joists openly doing their work, instead of being hidden in a casing in which dust and dirt can accumulate. If this simple and charming method of treating the ceiling is adopted, the usual deep, narrow timbers should be made shallower and wider to give an effect of strength when viewed from below; but special precautions should be taken to prevent the passage of sound from the room above to that below. Fig. 56 illustrates how this may be done; and also how the total amount of timbering required can be reduced by the use

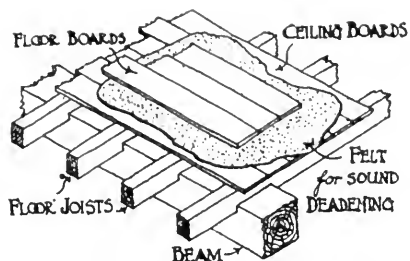


FIG. 56.—This illustration of an open timber floor is referred to on the opposite page. Wider and shallower timbers than usual should be used to construct these floors, in order to give an effect of strength when viewed from below.

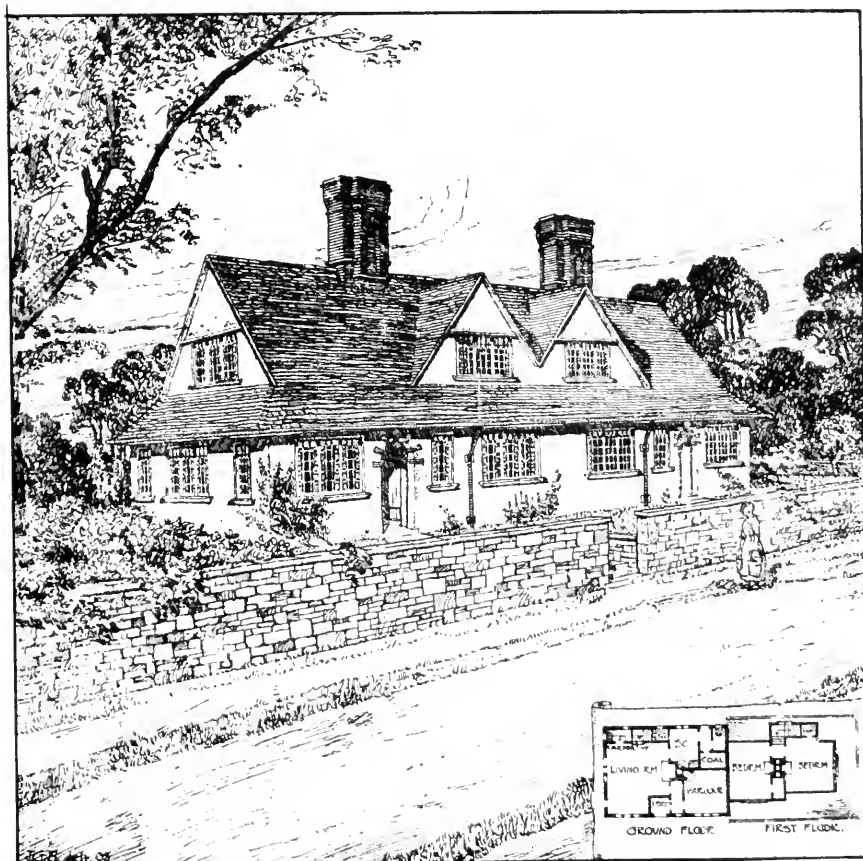


FIG. 57.—Roofing being cheaper than walling, the upper portion of this cottage is entirely in the roof. A large living-room, parlour, scullery, and the usual offices are provided on the ground floor, and upstairs there are two good bedrooms with cupboards. Materials: Brick chimneys, brick and roughcast walls, and a tiled roof. Cost: £210 each house.

of quite small joists strengthened by beams spanning the width of the room at intervals.

There are many kinds of fire-resisting floors. One of the best, which, however, generally costs rather more than the usual wooden floor, consists of steel joists placed from 2 ft. to 3 ft. apart, and the space between filled up with concrete. These floors are extremely sanitary. The upper surface may be treated similarly to those described under the preceding heading, and the soffit is most often plastered to form a ceiling.

FIREPLACES

The value and real economy of well-made stoves and grates is gradually becoming known, and now most manufacturers supply forms designed on scientific principles. The chief improvement in modern grates is the reduction of the use of iron in the construction. An iron body in a stove, even if it has a sloping back, fails to radiate heat to anything like the extent of that given out by fire-brick. While besides warming the room sufficiently, a grate with a fire-brick body and back results in great economy in fuel consumption, and reduces the coal to ashes, not merely to cinders.

As to the design of the fireplace itself, our best efforts should be used in making it really cosy and attractive. We cannot go far wrong in keeping it simple, which implies, above all, that the materials employed must be few. A plain brick or tile arch with similar surroundings looks as beautiful as anything, and, of course, elaborate metal fittings that require continuous and laborious cleaning will be avoided.

FITMENTS

There is a clear tendency in many quarters to build in the house, as permanent fixtures, not only sideboards,

dressers, and bookcases, but also the chief seats and lounges, hat and umbrella stands, and even some of the tables. These fitments are pleasant looking, and space and labour-saving, though perhaps are liable to be badly treated by some tenants. If, however, everything is plain and solid, we shall hear less of loose skirtings, balusters, etc., making good firewood. Although such fittings mean additional expenditure in the first instance, the subsequent cost of furniture will be saved.

Wooden enclosures to baths, lavatories, and w.c.'s serve no useful purpose, but simply harbour disease germs and filth. Only those who have seen an old bath removed will credit the amount of dirt that these casings collect. Pipes, too, are better boldly exposed.

FURNITURE

The golden rule in furnishing is to remember the simple principle that there shall be no more articles than are really required for practical purposes. Of late years a marked improvement has taken place in the furnishing of our homes ; but there is still a tendency to overcrowding with the trivial and useless. The keynote of all schemes should be simplicity. Let us make the most of a little and good, and rigidly exclude anything that favours the accumulation of dust, or interferes with free ventilation.

Naturally, old cottage furniture looks the best in a cottage. But if we cannot afford this, it is far more advisable to acquire—instead of imitation antique pieces—chairs, tables, and cabinets, etc., of good modern design, such as those exhibited by the Arts and Crafts Societies. These are the work of trained artists, and are beautiful and honest in workmanship. Ostentation and poor construction are faults commonly found in the goods turned out by large furnishing firms.

As to floor coverings, the "over-all" carpet—which is the greatest dust-trap known, and which can never be moved without shifting all the furniture—should never be allowed in the house. Rugs and mats are far preferable, as they can be taken out and beaten in the open without much trouble.

Curtains are also dust collectors, and should not be hung in flounces. The best kind are in small sections, and are hung loosely from light metal rods, so that they may be easily removed for cleaning.

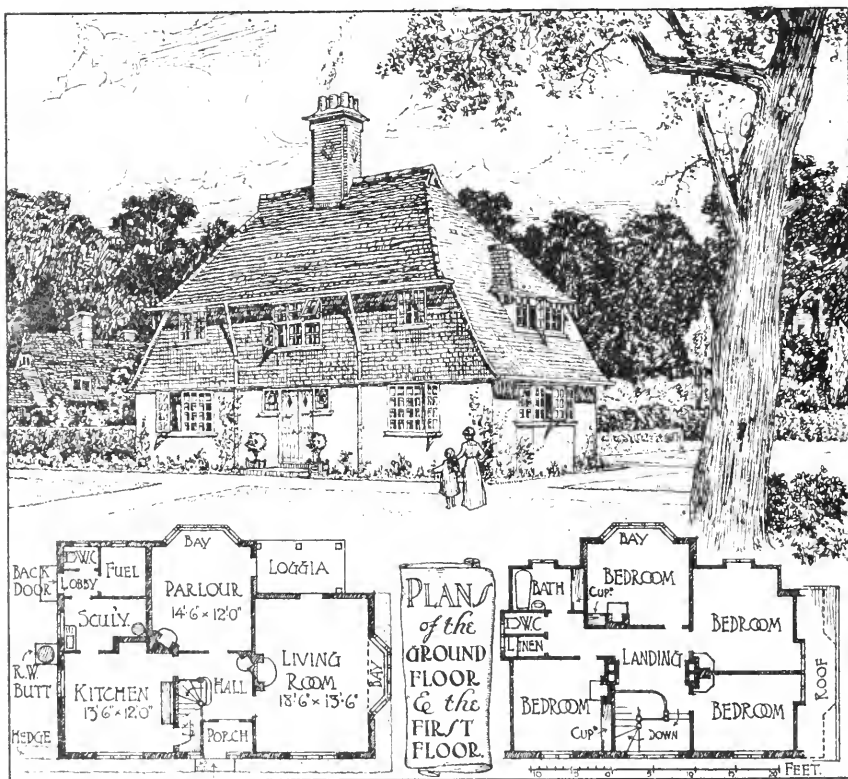
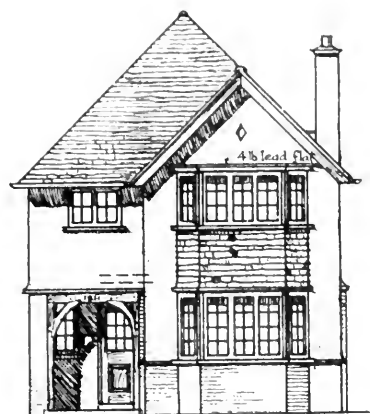
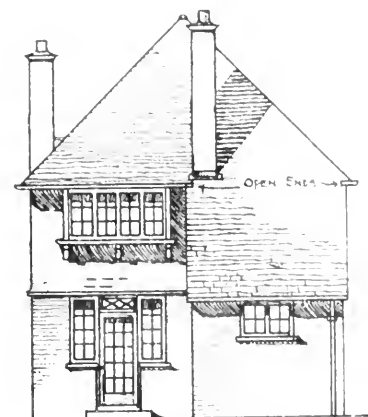


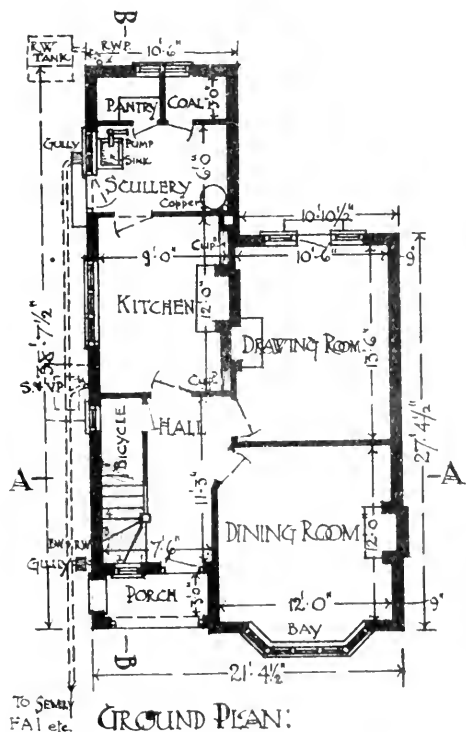
FIG. 58.—Here is a small house of the cottage type, with good accommodation, and costing nearly £500 to build. The lower walls are of limewashed brick, facing bricks are used for the chimney, and hand-made tiles for the roofing and upper storey wall-covering. Inside there is a large living-room, parlour, small hall with a fireplace, kitchen, scullery, and the usual offices, all under the main roof. There are four bedrooms upstairs, a bathroom, linen and other cupboards, etc. A good feature is the gathering together of all the chimney flues into one bold chimney stack; this keeps the whole house warm, and economises in brickwork, roof construction, heat, and fuel consumption.



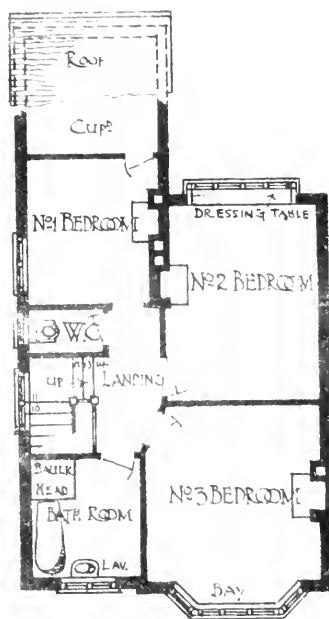
FRONT ELEVATION:



BACK ELEVATION:



GROUND PLAN:



BEDROOM PLAN:

FIGS. 59 AND 60.—This house, shown here by plans and elevations, was built at Jersey in 1911 for £330. It is of brick and roughcast, with a tiled roof. On the ground floor there are two living-rooms, a kitchen, scullery, pantry, coal cellar, and a space for bicycles under the stairs; with three bedrooms, bathroom, etc., upstairs. Another house will be built on the blank wall at a later date.

CHAPTER VII

MATERIALS

“Be not the first by whom the new are tried ;
Nor yet the last to lay the old aside.”

ADVANTAGES OF LOCAL MATERIALS

IN these days of commercial enterprise with the ever-increasing facilities of transport, both over land and sea, the selection of building goods has become a vastly different affair to what it was in past generations when the old builders had to be content with the materials found in the neighbourhood. But now, the choice is subject to no local limitations, though it is questionable whether this advantage is always a help toward artistic and suitable-looking building.

There is no need for any habitation of man to appear as a blot upon a view of natural scenery. In fact, a beautiful landscape can be, and often is, completed rather than spoilt by the addition of a pleasing group of cottages, or a small homestead nestling among the trees. Be that as it may ; but there is not the slightest doubt that if local building materials instead of “foreign” ones had been used, many a modern erection would harmonise far better with its surroundings.

The question of their choice, then, should solve itself. Local materials, apart from their aesthetic value of conforming with local traditions, are nearly always cheapest, and compare well with others from a distance, both as

regards appearance and durability. In a brick district, therefore, use bricks ; in a stone country, use stone ; and where suitable clean gravel is easily obtainable, some form of concrete may be cheaper and more suitable than anything else. The more our cottage is in the depth of the country, the more will these rules apply.

DOUBLE PURPOSE OF WALLS

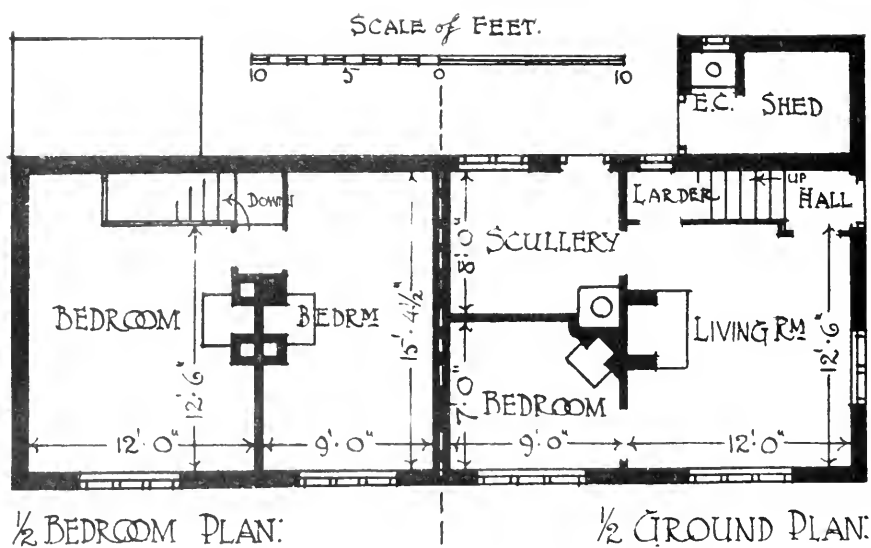
Dealing now with the materials more in detail, we will discuss them as far as possible in connection with the constructional features which they help to form.

It should be remembered that walls of houses are designed for the twofold purpose of protection from the weather and support of the roof and floors. In cottages of brick, stone, or concrete, the question of support does not need much consideration, for a weatherproof wall will nearly always be strong enough to carry all the weight put upon it. On the thickness of walls of most materials in common use largely depends the dryness and even temperature of a dwelling, and their nature as well as the way they are put together is of no small importance.

FOUNDATIONS

The nature of the soil and the weight of the superstructure determine the dimensions of foundations. In nearly all cases they are required, and should be taken below the vegetable earth and thus out of the reach of atmospherical changes. There should be no doubt about their sufficiency, for it is expensive work strengthening foundations after the house is built. In order to increase the area of pressure on the ground, there should be footings at the base of the wall projecting out on each side ; and, in addition, the concrete should be still wider.

Hydraulic lime, being cheaper than Portland cement,



FIGS. 61 AND 62.—These cottages, shown here by a photograph and plans, have been designed and built for £300 the pair by Mr. Clough. As they have been put up in several counties for this price, the experience as to building costs is spread over different neighbourhoods, which adds to its value. There are three bedrooms altogether in each cottage: the one downstairs might be used as a parlour if desired. A living-room, scullery, and simple offices complete the accommodation.

may be used for the concrete foundations under walls, and the proportion may be as little as one part of lime to six of clean aggregate (*i.e.*, the stones, broken brick, or gravel). But in the layer of concrete over the site—which is generally necessary and required by most by-laws—cement should be used for the matrix of the mixture.

This layer, frequently no more than 4 in. thick, sterilises the ground and prevents ground air and dampness from rising into the building, besides excluding, as nothing else will, vermin from under the floors. A good plan is to utilise this concrete to form solid floors, thus saving joists and sleeper walls. If, however, hollow floors are preferred, great care must be taken to provide plenty of cross-currents of air underneath the floor, in order to guard against the danger of dry rot setting in with its disastrous results. This very needful ventilation can be secured by inserting air-bricks in the lower parts of walls, and it is the duty of the householder to see that they do not get covered up on the outside by earth and the like.

DAMP COURSE

The walls of every modern building have a layer of impervious material generally about 6 in. above the ground, and always below all woodwork in floors. The object is to prevent moisture from rising up the walls into the house, for practically all walling materials are absorbent in a variable degree. All by-laws insist on a damp-proof course, and that it should not be omitted does not need advocating, for the menace to health and the damage to property caused by damp walls is well known.

Nothing is simpler, nor for the money more effective, than a double course of stout slates laid in cement with lapped joints.

Asphalte is useful, especially for a vertical damp-course.

but is not cheap, and the inferior makes squeeze out in hot weather.

Lead and bituminous felt are two materials sometimes used for damp-courses. Lead is too expensive to be frequently employed. Lapped joints are necessary in both cases, and being elastic, the layers remain effective in the event of a slight settlement in the building.

A few courses of Staffordshire blue bricks in cement are damp resisting. A plinth of these bricks have a fair appearance where roughcast walls are used; but if the colour is objected to, they may be whitewashed.

BRICKS

Good bricks are as durable as any material, but require careful selection for external work. As they are exposed to the attacks of the weather in this position, the question of absorption is extremely important, for it indicates their proneness to produce damp walls. For ordinary facing purposes, a safe rule is to reject bricks that absorb more than 15 per cent. of their dry weight of water. However, many of the softer and cheaper kinds, which would at once be condemned on account of their non-weathering qualities or poor appearance, are quite suitable for internal use, or where they can be whitewashed or roughcasted.

Homogeneity of surface and texture, toughness as opposed to brittleness, and clearness of ring when knocked together (a dull sound indicating a soft or shaky brick); these are some of the characteristics of good bricks.

VARIETIES OF BRICK

As regards their colour and appearance, some of the very qualities that many manufacturers point to with pride—such as mechanical precision of surface, and

uniformity of tint—are just those to be avoided. What we want is brickwork that will “weather” into a pleasant mellow tone, and any accidental variation in colour should not only be allowed, but required.

Some kinds of hand-made, sand-faced bricks are excellent for facings, as they soon tone down, though the poorer qualities quickly flake and crumble in exposed positions. Heather and Crowborough bricks have a distinct charm of their own.

The strongest bricks, excepting the expensive Staffordshire blues, which are so useful in damp situations, are known as stocks. Some of these have a pleasing rich yellow colour, and all have a rough uneven surface, making them valuable as a base for plastering and rough-cast.

For use anywhere except outside walling, more Flettons are employed than any other brick. As they have a very smooth surface, giving a poor key for plasterwork, the bricks have to be hacked over for this purpose, unless those with grooves have been chosen.

BONDS AND “BRICK DIMENSIONS”

The average size of bricks used in this country is 9 in. by $4\frac{1}{2}$ in. by 3 in. In the North of England they are made slightly larger than in the South; and thin bricks are often used for effect, but, of course, work out a good deal more expensive.

Their size naturally regulates the thickness and length of walls. Much unnecessary waste of bricks and labour is caused by spacing wall lengths and openings that are not multiples of $4\frac{1}{2}$ in. For instance, although 2 ft. 9 in. and 3 ft. 6 in. appear to be “round” figures, they are not “brick dimensions”; if we substitute 2 ft. $7\frac{1}{2}$ in., 3 ft., 3 ft. $4\frac{1}{2}$ in., or 3 ft. 9 in., no inconvenience will be

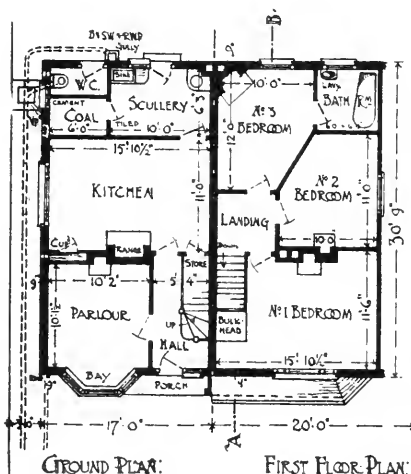
HOUSES IN COLLEGE ROAD, WEALDSTONE



FRONT ELEVATION:

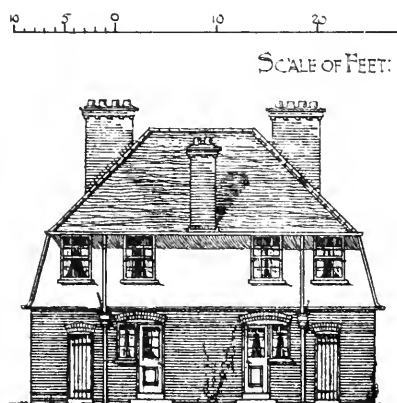


END ELEVATION:



GROUND PLAN:

FIRST FLOOR PLAN:



BACK ELEVATION:

FIGS. 63 AND 64.—These two small houses were built on narrow sites, at Wealdstone, in 1910 being square and with mansard roofs to save brickwork, they are of an economical type, and cost about £230 each. Downstairs there is a good-sized kitchen, parlour, scullery, and simple offices; and three bedrooms and a bathroom are upstairs. No outbuildings are required with this plan. Materials: Brick, tiles, and roughcast.

caused to us, and the bricklayer will be saved a good deal of cutting and chopping bricks to fit.

In every wall there should be good "bond"—that is, the arrangement of bricks in which no vertical joint comes exactly over the one in the next course above or below. The two most usual bonds are Flemish (Fig. 46) and English, in which a row of headers alternates with a row of stretchers. A very cheap method of building a 9 in. wall is to lay the bricks on their 3 in. edge with a 3 in. cavity, and a heading course either as illustrated in Fig. 65, or at larger intervals for still further economy. This arrangement makes quite a strong wall, and is suitable for receiving tile-hanging or roughcast.

DAMP-PROOF WALLS

A thicker wall than 9 in. will seldom be required for cottages as regards stability alone, although in the way of damp prevention a solid brick wall, 13½ in. or even 18 in. thick is not proof against a driving rain. Our ancestors tried many methods of building dry walls out of porous materials, and much may be learnt from their old dwellings situated behind hills or with tree screens on the exposed quarter.

We have already mentioned whitewash as being of use in rendering walls more weather-tight. There is no doubt that some such water-proof distemper is as cheap a means of protection as any ; and it looks well on brick or stonework, when the joints are set well back from the face of the wall. Other methods of building damp-proof walls will now be discussed.

ROUGHCAST WALLS

Roughcast, whether applied on brick, stone, concrete or lathing, forms an extremely eye-pleasing and effective

resistance to the weather. The operation may consist of dashing a mixture of "hot" lime and clean shingle on a cement plastered surface before the latter has set. The required colouring pigment should be added to the mixture before being applied, and nothing looks better than a pure white. Some may prefer the surface tinted a deep cream, or perhaps a light pink colour, which is often delightful; though later on the distempered wall will look shabby and call out for a new coat, while its white neighbour mellows more and more charmingly with the passing of the seasons.

There are several other ways of treating cemented walls, but roughcast with its textured surface is the most satisfactory. Of course anything in the way of imitation stonework with joint lines will be at once discountenanced.

A coating of roughcast keeps the walls weather-tight, and, as a set-off against its extra cost, an inferior brick may be used behind it.

CAVITY WALLS

Hollow walls for cottages and small houses, where cheapness is a consideration, are generally composed of two half-brick skins with a 2 in. cavity, thus bringing the total thickness up to 11 in. The two walls are connected together with galvanised iron ties, 3 ft. apart horizontally and 18 in. vertically, which are bent and twisted to prevent moisture from passing from the outer to the inner portion of the wall. Figs. 66 and 67 shows two examples of these ties, and also a bonding brick sometimes used for the same purpose.

Although the cushion of air in the cavity is the finest possible non-conductor of damp and heat, there are many objections to this kind of construction. The cost to build is

excessive, especially as a good deal of lead is required over door and window frames; since the cavity cannot be flushed with light and air, it is unsound hygienically; and the outer wall can become saturated. A 9 in. wall, especially if built as shown in Fig. 65, and covered with cement or roughcast, is cheaper and on the whole more satisfactory than a hollow wall. Concrete and stonework are also occasionally constructed with cavities in a similar way to that just described.

WEATHER TILING

Tile hanging is one of the most picturesque methods of treating a cottage wall (see Fig. 58), and nothing keeps the interior dryer and warmer. Ordinary roofing tiles—measuring $10\frac{1}{2}$ in. by $6\frac{1}{2}$ in. by $\frac{1}{2}$ in. thick—or those of an ornamental character shown in Fig. 71 are used. They should have projecting nibs, in addition to the two nail holes, for fixing purposes.

Figs. 78 and 79 illustrate some methods of hanging tiles to brickwork without having recourse to wood laths, which soon decay when built in the wall. Perhaps the soundest and certainly the cheapest way is shown in Fig. 70, in which the tiles are nailed direct to brick-on-edge. The bonding of the wall may be seen in Fig. 65. Geometrical tiles (Fig. 69) are extremely useful for water-proofing an existing or new wall. They can be nailed to the joints of ordinary brickwork, and when jointed with mortar look exactly like a brick wall.

The tiling should not be continued down to the ground, as the lower courses would then be liable to get broken. As has been mentioned before, well-defined horizontal lines cause a dwelling to look lower and more cottage-like; and so if we can stop the tiles all round at some such level as the ground floor window heads, and give the last few

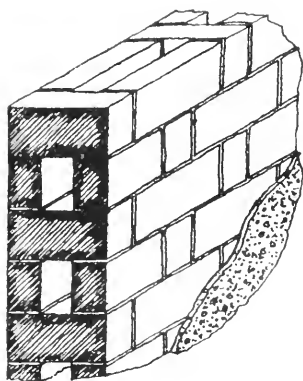
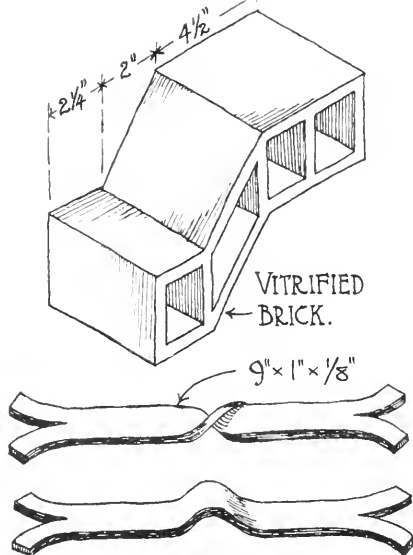


FIG. 65.—This illustrates a cheap method of building a 9 in. wall with the bricks laid on edge. An even cheaper wall can be built with the "headers," or through-bricks, at greater intervals, as mentioned on page 103.



FIGS. 66 AND 67.—A boning brick and two varieties of galvanised iron ties are shown here and referred to on page 104. They are used for connecting together the two skins of a cavity wall, and the bend prevents the passage of moisture.

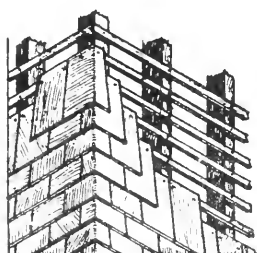


FIG. 68.—This sketch shows tiles hung to wooden laths. Figs. 70, 78, and 79 give methods of hanging tiles without the use of woodwork, which is liable to decay.

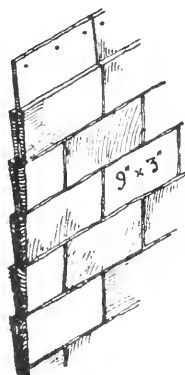


FIG. 69.—Geometrical tiles are shown here. They can be nailed to ordinary brickwork, to the appearance of which they look very similar when in position. (See page 105).

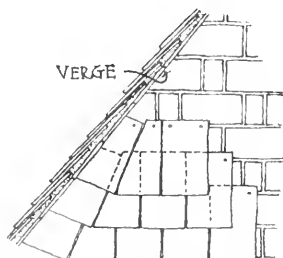


FIG. 70.—This drawing, referred to on page 111, shows the verge at a gable end. The projecting tiles should have a soffit course bedded flat, and be jointed in cement. Tile-hanging is also shown here nailed to brick-on-edge.

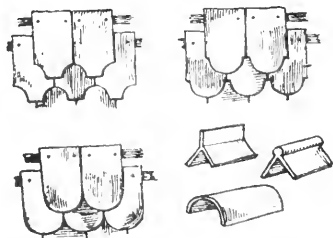


FIG. 71.—Three varieties of ornamental tiles with three ridges are illustrated here. As mentioned on page 111, ornamental tiles lose their effect if used in large numbers; half-round ridge tiles are referred to on page 113 as being the cheapest and best.

courses a wide projection to keep the lower walls dry, it will be as good an arrangement as any.

STONE WALLS

There are many kinds of stone walling, the names of which vary with the locality ; but there are two main divisions--ashlar and rubble masonry. Rubble walling is mostly used in cottage work and should not be less than 18 in. thick. There should be at least one "through-stone" to every square yard of face, and even then its strength, as well as imperviousness, depends largely on the quality of the mortar employed.

The appearance, too, is very much influenced by the nature of the joints, which look well and keep the water out best if made strong and distinct, and recessed back from the face of the wall. Although a wall of rubble stone must of necessity be thicker, it will, where stone is easily accessible, be less expensive than brickwork. It will also harmonise better with the local styles of building in such districts.

WALLS OF BRICK AND STONE

Even in the heart of stone neighbourhoods, bricks are generally used for internal walls, and very often where they are cheap, for internal facings of outside walling. The reason is that bricks are easier to lay, and require much less plaster than rough stonework.

In small houses, the usual thickness for these composite walls varies from 12 to 15 in. The outer facing of stone is 4 or 5 in. thick, with a $4\frac{1}{2}$ in. brick backing, and the space between is filled up with small stones. There should be plenty of bonding stones, and every fifth course of the brick lining should be of headers.

Where the walls are of squared stonework with a backing

of bricks, the depth of the stone courses should be multiples of 3 in., so as to fit in properly with the brickwork.

CONCRETE BLOCKS

Concrete is unquestionably the building material of the future. It makes a stronger wall than one of the same thickness in brick or stone, and may be a good deal cheaper if the workmen are used to it, and if good aggregate can be obtained without much expense. For the aggregate, which must be free from earthy matter and sulphur, many materials are suitable, such as broken brick, stone chippings, river ballast, gravel, pottery, slag, coke breeze, clinker, burnt clay, etc., etc.

The cost of a concrete block-making machine will be prohibitive unless several cottages are to be erected, but the blocks may often be made cheaply without a machine by the ordinary farm labourer.

MONOLITHIC WALLS

It may well be argued that it is a waste of time and money to make blocks when a wall can be built monolithic. Jointless walls are generally cheaper and certainly stronger, and many satisfactory cottages have been built in this way, both at home and abroad. Concrete walls are also referred to in Chapter X.

The work is built between planks, which are raised as the walls set. Its durability depends in a great degree on the cleanness of the aggregate; the quality and quantity of the matrix, which should be of Portland cement; and on the efficiency of the mixing. It is important to use cement in correct proportions (this will vary with the nature of the ballast), and no walls should be built in frosty weather.

ROOFS

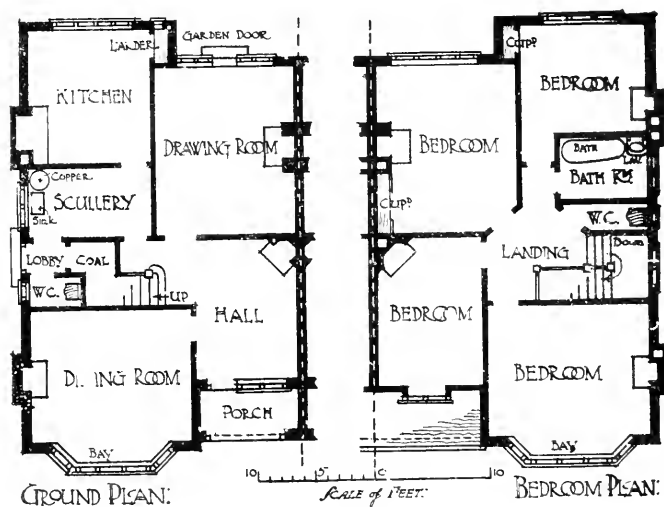
It cannot be repeated too often that the simpler a roof is kept, the cheaper it will be, and the better it will look. Numerous gables, hips, valleys, dormers, and other breaks in the roof entail an increase of labour and material, and, not carrying water off so well, necessitate repairs. The more usual roof coverings will now be mentioned.

SLATES

The material chosen determines the form of a roof, and generally the smaller the individual members of the roofing, the steeper should be the pitch or slope. For instance, large slates will be quite waterproof when laid to so low a slope as 30 degrees, though if steeper, the roof will be more durable and artistic, besides giving more room for attics.

Slates have the disadvantage of being good conductors of heat, and thus making upper rooms hot in summer and cold in winter. They are often cheaper than tiles, and sometimes preferable in exposed situations, as they are less absorbent and can be used with a lower pitched roof. In cottage buildings, slates should be of a small size to be in keeping with the scale generally, and the most pleasing effect is obtained where the widths vary, and the large slates are kept near the eaves, the courses gradually diminishing in size as they ascend towards the ridge.

Portmadoc slates are the cheapest kind, and wear well, though their appearance leaves much to be desired. If, however, the small sizes are chosen, the roof will look fairly presentable, provided the walls are not of red brick, which never harmonises with blue slates. Where a little more money can be spent, Welsh or Westmoreland green, and Precelly slates are to be recommended.



FIGS. 72 AND 73.—These middle-class houses were built in 1910 at Hitchin at a cost of £800 the pair. They contain two sitting-rooms, a decent hall with a fireplace, good kitchen offices; and four bedrooms, a bathroom, and cupboards, etc., upstairs. Brick is used for the chimneys, tiles for the roofs, and the walls are covered with roughcast. The mansard roof between the two bay-windows is an economical feature, as it saves brickwork.

PLAIN TILES

Great care, too, must be taken when selecting tiles, if the roof is ever to possess that mellow charm that time alone can give. Hand-made tiles are the best, or failing these, sand-faced ones; they soon lose their new appearance and “weather” into beautiful sombre shades. Anything in the nature of pressed, semi-glazed, machine tiles—which are sometimes of a “boiler-plate” tint—should be avoided, as they produce hard, mechanical effects. A good way is to mix old tiles with new, in order to make a roof look interesting, and it is always better not to insist on uniformity of colour or surface.

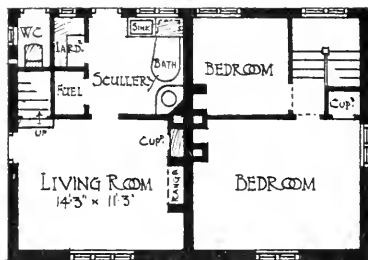
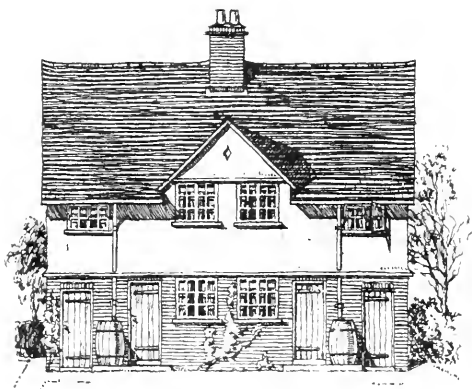
Tiles are generally laid to a $3\frac{1}{2}$ or 4 in. gauge,* and though the text-books say that an angle of 45 degrees is the most suitable, a slightly steeper slope has a far better appearance and is more durable. In Fig. 76, which shows ordinary tiles hung on battens, notice the curve in their length; this causes the tiles to grip on the one below, and keeps out driving rain.

Ornamental tiles—a few are illustrated in Fig. 71—lose their effect if used in large numbers. A few worked in the middle of a gable, perhaps to a diamond pattern, contrast well with plain tiling. For hips and valleys, purpose made tiles, with curves and not angles, are the best. At gable ends, where there is no barge-board or parapet, the verges should be treated with a soffit course of tiles bedded flat (see Fig. 70) and be given a good projection.

PANTILES

Most varieties of pantiles are considerably cheaper than ordinary tiles or slates, and they allow the use of low-pitched roofs. Parapets should be employed at the

* The gauge is the distance apart of the nail holes, or the width of the exposed part of each course when in position.



GROUND FLOOR: FIRST FLOOR:

FIGS. 74 AND 75.—Here is a pair of simple four-roomed cottages, built of brick and roughcast, and with a tiled roof. The dwellings are self-contained, all offices being within the main block, and the cost is about £210 the pair, according to district. In the scullery the bath, placed near the copper and sink, forms a convenient table when not in use. Fig. 74 shows the back elevation.

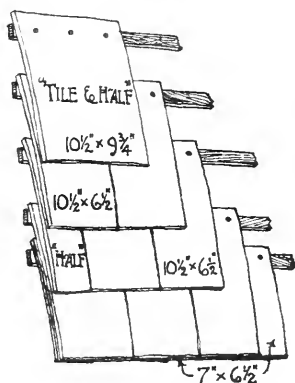


FIG. 76.—This sketch of roofing tiles hung in position is referred to on page 111. It shows a "tile and half," an ordinary tile, and a "half."

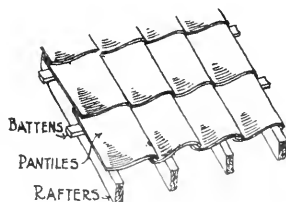
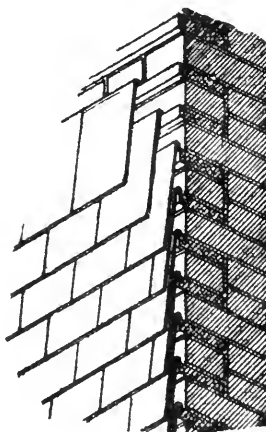


FIG. 77.—As mentioned on page 113, overhanging verges are almost impossible with pantiles, which are illustrated here. Breaks and openings in a pantile roof should be avoided, waterproof joints being difficult to make.



FIGS. 78 AND 79.—These two illustrations show methods of hanging tiles to brick walls without having recourse to wood laths, which are liable to decay. They are described on page 105. One way is to nail the tiles to wide brick joints of special mortar, the wall being built as shown; in the second method, thin concrete blocks are built in the wall, and the tiles are hung and nailed to these.

gable-ends (overhanging verges are almost impossible with pantiles), and if there are any dormers, the latter should have flat tops in order to save the necessity of ugly and awkward junctions in the roofs. As it is difficult to make waterproof joints in pantile roofs, hips, valleys, and breaks should be as few as possible.

Figs. 31, 60 and 77 are illustrations of pantiles. Some of these large tiles are manufactured in inferior qualities, and soon crumble away because of their porousness. If they are found defective after being laid, the best thing to be done is to give the roof a coating of tar—a treatment often seen in the case of old cottages.

THE RIDGE

Much of the effect of a roof depends upon the ridge, which requires careful attention to be satisfactory. What is wanted for the sake of appearance is a soft sky line, and nothing sharp or ornamented should be permitted. No feature of the suburban villa is more inappropriate and out of proportion than the decorated ridge with its crude dragons and unsightly finials, which besides being ugly are expensive both in the first instance and also in upkeep.

Half-round ridge tiles (see Fig. 71) are the best and cheapest with a tiled roof, and these also look well on hips as shown in Figs. 7 and 58. In slate roofs, the ridge and hips may be of stone, slate, lead, or tile with good effects, provided they are kept quite plain.

EAVES

Wide eaves give valuable shadows, and protect the walls and upper windows from the weather, so are of great importance. A total projection of 18 in. is not too much, and if the eaves are as continuous as possible with no breaks, the question of down-pipes is simplified.

Gutters are always necessary, and look well if supported by wrought iron brackets of simple design (Figs. 45 and 89). When choosing the eaves gutters, remember that half-round ones have a stronger and nicer appearance than those with mouldings, and the square kind are better still. The gutters last longer if tarred inside instead of being painted ; and the down-pipes should project from the wall-face, so that the painter's brush can get all round them.

There are many ways of treating eaves, but perhaps the most charming is when the "soffit" or underside is plastered up. Another method, which gives an effect full of constructive interest, is to let the feet of the rafters project, so that they are seen from below.

HALF-TIMBER WORK

It is now practically impossible to produce the beautiful appearance of "black-and-white" walls, owing to the by-laws in force at the present time in most rural districts. In the old houses of Cheshire, Warwick, and Kent, the charm of half-timber was obtained by sound and truthful workmanship, stout oak timbers substantially framed together forming an essential part of the construction.

The genuine article is expensive, and of the abundance of modern "half-timber"—a style greatly affected by some speculative builders—almost every case is a sham and soon exposes itself as such. It usually consists of thin boards nailed to brickwork and provided with projecting pin-heads to help the effect, and the spaces between are filled with roughcast. Another and still more objectionable practice is to have cement strips on the wall surface grained and painted in imitation of oak.

THATCH

A second delightful old-world material that is rapidly disappearing is thatch. It is prohibited where by-laws

are in existence, and there are many other considerations against its use. Perhaps the chief objection is that thatch only lasts about twenty years, and less if made of straw; and it soon becomes full of insects. The danger of fire, too, is a real one, and most insurance rates are double that for tiled or slated dwellings. It is also difficult to obtain skilled thatchers in most parts of the country.

Thatched roofs are comparatively light and require fewer and smaller timbers than do other materials; and being a bad conductor, thatch keeps the roof-rooms warm in winter and cool in summer. Guttering is not always used, but the eaves must project well out from the walls, and the ground underneath should be paved to take the drippings. For roofing garden-houses, there is no more suitable and picturesque material than thatch.

VARIETIES OF TIMBER.

Woodwork has already been referred to as being a troublesome matter in modern building. Although we are gradually learning to use substitutes for timber in all directions, experts prophesy a famine in the world's supply in the course of a few years. At present the demand is so great that adequate seasoning is rarely the rule.

Partly on this account, English oak, which once had such an unblemished reputation, is, owing to its tendency to shiver and split, being ousted by the imported article. Austrian oak is now largely used instead, especially for internal work, and pitch pine, teak, and elm are often specified for exposed positions.

For such purposes as weather-boarding, and in the old-fashioned ledged door now so fashionable, elm is one of the most useful woods, though generous allowance should be made for shrinking.

Deal is more used than anything for joinery work, and

is reliable and looks well just stained without any attempt to imitate anything rarer.

Ordinary constructional timber, such as that in floors and roofs, is nearly always of fir and pine from Russia, Norway, or Sweden ; while the more precious woods that are used for decorative purposes do not need mention as they will be seldom seen inside cottages.



FIG. 80.—This photograph is of the garden front of the cottage illustrated in Figs. 81 to 85. The bay-window shown on the right is a feature of the living-room, and its Ruberoid flag roof forms a balcony above. Smooth plaster, distempered a cream tint, covers the walls, and old tiles are used on the roof.

CHAPTER VIII

SANITARY MATTERS AND LIGHTING

SIMPLICITY AND EFFICIENCY

WHILE fortunately nearly everybody in these days realises the vital importance to health of an efficient drainage scheme, it is strange that so few people understand even the outstanding principles connected with the subject. There is no doubt that every householder has an interest in the matter—house-agents will tell you that “Are the drains all right?” is the question they are most asked—yet to most people “the drains” are shrouded with quite an air of mystery.

This general ignorance is probably due to the fact that the greater part of the construction is buried away out of sight, which also accounts for occasional scamping of the work, although on the whole in no branch of the building trade do we find such a high standard of fitness. It may even be admitted that some sanitary experts are prone to complicate needlessly appliances and fittings. But the best authorities agree that the simpler all such arrangements are made, the more effective will they probably be.

SEWAGE DISPOSAL

Whenever possible, the cottage owner will be well advised to connect the private drains with the public sewer, for there his responsibility ends. The local authority then deals with the sewage, and part of the rates go for

this purpose. In districts having by-laws, one is compelled to make a connection with the sewer, provided it is within 100 ft. from the site* of the house. Often, however, there is no sewer within reasonable distance, and none whatever in many rural localities which are just the place for a country cottage, so that other means of disposing of sewage must be considered.

The cheapest method of all is the earth-closet system, and this in a modern form is perfectly sanitary and inoffensive.

Perhaps the most satisfactory way where there are suitable grounds, is to pass the sewage through a liquefying or septic tank. The resulting effluent, after it has flowed over filtering material, is harmless and often quite pure, and can be discharged into a neighbouring stream or used for other purposes.

The old-fashioned cesspool is more economical than the last-mentioned, and after a word or two about E.C.'s and septic tanks, we will describe how it works.

EARTH CLOSETS

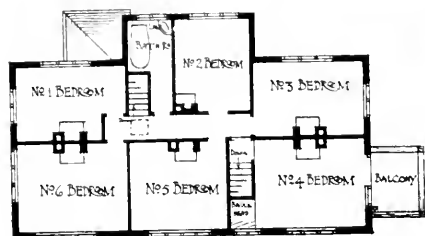
A modern earth-closet system is very different from the structure behind many a labourer's cottage, and may be used with safety in country districts if proper attention is given to it. One of the greatest advantages is its cheapness. There is no water-rate, sewer-rate, or plumbers' bills ; and there is " a good return from the well-cultivated and well-nourished garden " says Dr. Poore, a strong advocate of earth-closets, in his " Essays in Rural Hygiene."

Fine earth is the best deodoriser, and this or ashes or sawdust is added either by means of an automatic

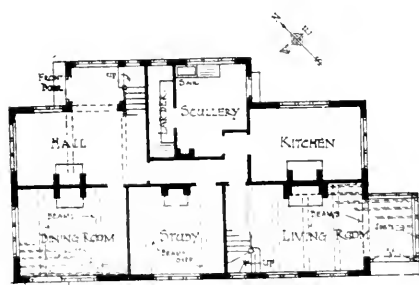
* This is usually, but not always, held to mean the actual piece of land on which the dwelling itself stands.



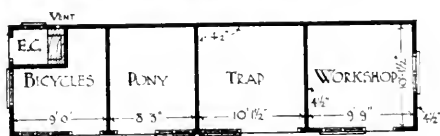
COTTAGE AT PERRARD, OXON
for
J. C. LEONARD MORGAN-BROWN ESQ.
LONDON ALLEN, ARNOLD, & CO. ARCHT.
HAYMADE ROAD, WEST HAMPTON, LONDON



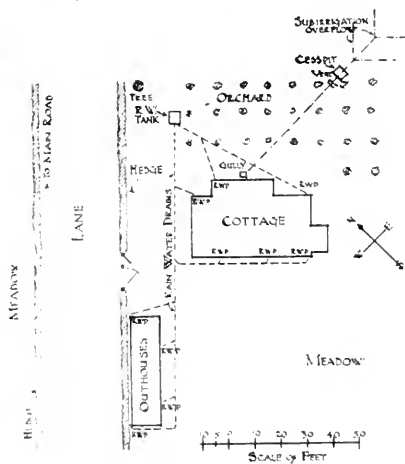
FIRST FLOOR PLAN:



GROUND FLOOR PLAN:



PLAN of OUTHOUSES:



SITE PLAN:

FIGS. 81 TO 85.—This country cottage, shown here by plans and a view, and in Fig. 80 on page 116 by a photograph, was built in 1911 at a remarkably low price, considering its accommodation and the good quality workmanship employed. For the house and stable outbuildings, complete with all drainage, the contract price was £501, which works out at under 4½d. per cubic foot. As will be seen, there are two staircases, four small sitting- and six bedrooms, a long lumber-room in the roof, and the usual offices. All ceiling joists and beams are left exposed, and the woodwork throughout is treated with a preservative, instead of paint. Old bricks are used for the fireplaces, with plain arches and surrounds, and the plastering was tinted before being laid on the walls. Exteriorly, the walls are rendered with smooth cement, which was distempered a cream tint, and the roof is covered with old tiles. In the living-room, a feature is made of a large glass bay-window, which has a flat Ruberoid roof forming a balcony to the bedroom above. The site plan shows how the roof water is collected into a rain water tank, which has a pump; and how the bath and sink water is used to give nourishment to the kitchen garden.

arrangement, or by hand. Neither the seat nor the receptacle should be fixed, and the latter should be emptied every day or two. The earth is valuable as a fertiliser in the garden and can be used over and over again after it has rested a few weeks. It should be buried only in the top layer of cultivated ground, as this is full of living organisms, which rapidly disintegrate and oxidise any substance deposited on it.

Liquids should be kept out of the pail as much as possible, as they tend to destroy the dry principle, and assist and encourage the process of putrefaction, which is the chief object to avoid. The key to success is the separation of solid from liquid refuse. Domestic slops should be poured on the surface of the garden, and not deeply below the ground where there is no exposure to the purifying sun and air.

The closet itself should be well ventilated and well lit, and be entered direct from the open air where possible. If the approach is inside the house, it is best to have a ventilated lobby as in Fig. 34, and when the closet is on the ground floor a small external door should be provided for the removal of the receptacle.

BACTERIAL TREATMENT

For a large country house, or several cottages together, there is no more efficient method of disposing of the sewage than that with the help of a small bacteriological installation, which is a good deal simpler than the term suggests. The main principles are to collect the sewage into a tank, where it is liquefied by the action of anaerobic bacteria, which destroy the solids; the effluent is then allowed to percolate intermittently over filtering material where it is acted on by aerobic organisms, after which the liquid is fit to be carried away to any desired outfall, or

may be discharged on the land to find a water-course for itself.

The exact method of treatment will vary with circumstances, such as the extent of the land available and the number of tenants in residence. For a population of twenty, a combined septic tank and filter with automatic distributor (all measuring 8 ft. by 4 ft. by 4 ft. with a capacity of 400 gallons) is sufficient.

CESSPOOLS

For an isolated cottage or small house with a water supply, and a garden of limited size, it will be most convenient to adopt the more familiar cesspool, though it often has to be made as much as 100 ft. away from the dwelling. Cesspools can be built of brickwork or concrete, rendered in cement to prevent the contents from soaking through and fouling the adjoining ground. They should always be as far away as possible from any well or spring, which would otherwise be liable to be contaminated, and be properly ventilated by a pipe carried high up.

Perhaps the chief objection to a cesspool is that it has to be emptied at regular intervals ; if, however, only actual sewage is allowed to enter into it, and rain-water and other liquids are accommodated elsewhere, this troublesome business need not be nearly so frequent. A very good method, which requires practically no attention, is to arrange the cesspool on the principle of a septic tank, and have an overflow pipe emptying just below the soil in a kitchen garden by a system of sub-irrigation pipes

DRAIN PIPES

With the exception of earth-closets, the drainage arrangements just described require the water-carriage system for

the removal of the sewage. This necessitates rather elaborate pipes and fittings, so it will be well to discuss the latter briefly.

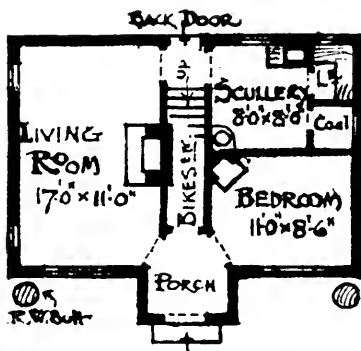
Glazed stoneware pipes are usually used for underground drains, and they should be very carefully jointed into each other to form straight lines from point to point, with inspection chambers at all angles and junctions. It is important that the pipes have a proper fall, and no more and no less, so that the liquids will carry away the solids. A fall of 1 in 40 (*i.e.*, 3 in. in 10 ft.) is the best for 4 in. pipes, and 1 in 60 for 6 in. pipes. Pipes 4 in. in diameter are large enough for any drain ; the smaller they are, the more self-cleansing will they be.

Every section of the system should be easily accessible to facilitate the use of rods for remedying any obstruction that may occur, and for testing and locating faulty pipes. Manholes or inspection chambers should be used where the branch pipes join the main drain ; and care must be taken in planning to bring together as many of the branches as possible to save unnecessary expense. Air-proof covers should be supplied to the manholes near the house, and the drains continue through these chambers in open channel pipes.

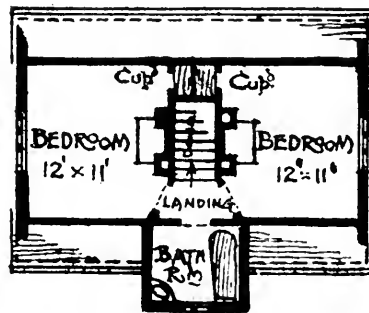
The vertical drains from the upper floors are generally of lead, but if of iron for the sake of economy, they should be coated inside with rust-proof composition. Before being passed, all drains, both vertical and horizontal, should be tested by being filled with water and then left for half an hour, after which a leak may be detected by noticing the level of the water at the top of the system.

TRAPS AND VENTILATION

The cottage owner will find his greatest safeguard against the menace to health of indifferent drainage in the



GROUND FLOOR PLAN:



FIRST FLOOR PLAN:

FIGS. 86 AND 87.—Being of an economical type, with the bedrooms partly in the roof, there is a demand for this kind of cottage for the use of "week-enders" and others. Upstairs, a bathroom and two bedrooms with cupboards are provided; the ground floor consists of a good hall with a large space suitable for storing a perambulator or bicycle, living-room, 17 ft. by 11 ft., bedroom which can be used as a parlour, and scullery, etc. The central chimney stack is of red brick, the roof is tiled, and brick and roughcast are used for the external walls. The building cost is £215.

proper ventilation of the whole sanitary system, and the trapping of all inlets to drains inside the house.

A "trap" is simply a downward bend in the pipe which, by retaining a certain quantity of water (this is renewed each time the fitting is flushed), forms a check and prevents the ingress of foul air into the house.

Every trapped section should have a continuous circulation of air. This can be obtained by placing a fresh air inlet at the lower end, and a foul air outlet at the highest point in the system, either carried up above the roof right away from any window, or perhaps on a conveniently situated tree. The inlet may have a mica flap to prevent it from acting as an outlet, and the high outlet should be covered with wire to prevent it from becoming stopped up by leaves or birds.

It is also essential that the sewer or cesspool, into which the drains discharge, should be isolated by a trapped manhole. Fig. 88 shows a good type of an interceptor trap with an inspection eye provided with an air-tight plug.

SANITARY FITTINGS

Great care should be taken to choose fittings that are simple in construction and easy to keep clean. They should be placed against outside walls of well-ventilated and well-lighted rooms having impervious walls and floors, and no wooden casings should be allowed to collect dust and dirt around closets, baths, or lavatories.

The best kind of water-closet is that known as the "wash-down" pedestal. It should have a lift-up seat; and the water-waste preventer, which forms an effective disconnection from the main cistern, should give a thorough flush and refill rapidly all in a noiseless manner.

Sinks and lavatories should be of glazed stoneware, but in the case of the bath, nothing gives better results than

one of cast-iron covered with a good quality metallic enamel. Baths and lavatory basins should have trapped wastes; sinks on the ground floor have to discharge directly over trapped gullies; and in the water-closet the trap is in the apparatus itself.

Although not a sanitary matter it may be mentioned here that baths of a smaller size than usual have many advantages, and symmetrical baths are generally preferred to those of coffin shape. They should stand clear of the wall on three sides, and it is worth reiterating that modern sanitarians condemn woodwork enclosures to any of these fittings.

HOT WATER SUPPLY

A cistern at the top of the house is necessary for most hot water systems, and it is very useful in case of a breakdown in the main water supply. There is no necessity for this storage to be large, for practically all the taps downstairs will be direct from the rising main. The question of water is discussed in Chapter II.

It is essential that we should be aware of the quality of the water before the pipes are put in. If soft or rain water, with its saline properties, is used, lead pipes cannot be employed with safety, owing to the chemical action of soft water on them. Galvanised wrought iron pipes will be found satisfactory in this case and also when the water is hard, although it will not be long before the pipes, and especially those circulating hot water, receive a coating of lime.

Of the two hot water systems in general use, that with a cylinder instead of a tank is considered more efficient and safer, though in either case, care must be taken to ensure that the safety valve is in working order. It is a good plan to place the cylinder or tank in a linen cupboard

next to the bathroom, so that its heat can be utilised to keep linen aired. Another point worth troubling about is that a hot water pipe projecting from the wall makes an excellent towel rail. For the sake of economy in metal and heat, and efficiency in the hot water supply, the pipes should be kept as short as possible by arranging the bathroom in close proximity to the kitchen range.

GEYSERS

For the supply of hot water upstairs, oil or gas geysers have become deservedly popular during recent years. They are cheap compared with the price of ordinary hot water fittings, and save much in fuel, as the jet need only be lit a few minutes before bathing times. Their use does away with the necessity for a large kitchen fire, which may cause a good deal of discomfort in summer weather, and is an advantage when early morning baths are required.

Whether the geyser is situated in the bathroom, or just outside so that those unaccustomed to its use cannot go wrong, it should be fitted with a ventilation pipe through which the combustion fumes can be carried off into the open air. A dual tap controlling both the water and the heating arrangement is sometimes supplied for safety.

ELECTRIC LIGHT AND GAS

In the way of convenience, hygiene, and beauty, electric light is undoubtedly the best illuminant, but for the majority of cottages in the country, even where a public supply is available, the cost is prohibitive. For an isolated small house, a private plant is generally out of the question on account of expense. But if a few neighbouring cottage dwellers agreed to co-operate, there is no reason why it should not be possible, and even profitable, to run a small electric lighting installation.

Although the price of gas in country districts is usually high, we shall generally find that it pays to have a supply. Gas can be used for cooking and heating purposes, and saves an immense amount of fuel as well as labour in household work. Many doctors consider gas unhealthy in bedrooms, and a great saving will be effected if we only have the light laid on in the chief living-rooms. The consumption of gas is also reduced by the use of upright and inverted incandescent mantles, and at the same time the lighting and its decorative qualities are much increased.

OIL AND PETROL

Where oil lighting is used, a lamp-room in an outhouse is a great convenience and practically a necessity for trimming wicks and storing lamps when not in use. Oil barrels always seem to leak, and it is impossible not to spill oil occasionally.

There are some lamps now on the market in which petrol and ordinary incandescent mantles are used. They are perfectly safe and go out when tipped over, and are said to cost less in upkeep than paraffin, while giving a far superior light.

ACETYLENE AND VAPOUR GAS

Acetylene is a brilliant and fairly cheap illuminant, and of late years has been used extensively in country parts as the generating plant required is simple. The gas is made by adding water to calcium carbide, and is explosive, but no more dangerous than coal gas. A plant large enough to supply light to two or three cottages costs about £70.

A number of well-known firms specially cater for small petrol gas-producing installations, which have greatly improved in design recently. One kind generates weak

gas made with petrol and air, the latter forming over 95 per cent. of the mixture. The apparatus, measuring under 4 ft. square, is simple and easy to work, and costs about £50 when of 2,500 candle power, the gas working out at 1s. per 1,000 feet. As the gas will only light through special burners, there is a distinct advantage in the way of safety.

ELECTRIC BELLS

Although many people prefer the old-fashioned pull-bells in a cottage if any are required at all, the advantages of electricity in this connection should not be overlooked.

No battery is more efficient and simpler than that known as "Leclanché," which generates the current with the help of an "exciting fluid"—a solution of sal ammoniac—and two "poles," one of zinc and the other carbon. Pushes are arranged at various parts of the house and a pressure on one of these completes the circuit and sets the gong ringing, and, if necessary, can be made to shake an indicator. The only attention needed to a well-made system is the replenishing of the water in the battery, and the renewing of the solution once a year.

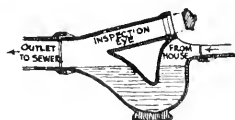
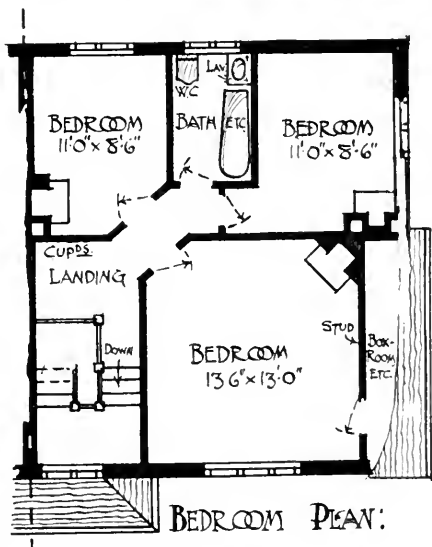
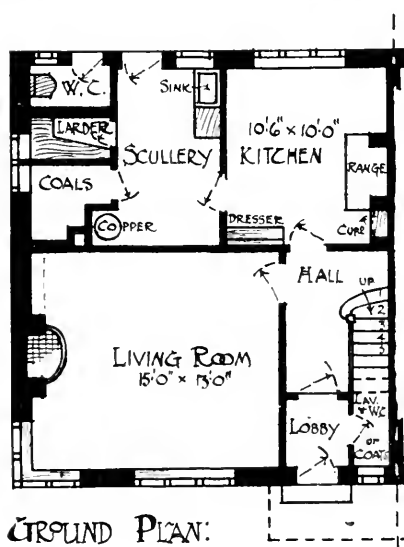


FIG. 88.—This Intercepting trap is employed for the purpose of disconnecting the house drain from the sewer or cesspool, as mentioned on page 124.



FIGS. 89 AND 90.—£552 is the cost of building this pair of cottages, which are economical and strong in appearance, owing to the mansard roof. Brick is used for the lower walls, with roughcast above, the gables are half-timbered, and the roof is tiled. The accommodation upstairs consists of three bedrooms and a bathroom, etc., with a living-room, kitchen, scullery, etc., on the ground floor.

CHAPTER IX

PRICES, CHEAP BUILDING, BUILDERS, AND ARCHITECTS

THROUGHOUT these pages we have endeavoured to bear in mind this paramount question of cost. A more detailed consideration of the matter, however, was reserved for this position near the end of the book, despite the fact that the price of a cottage is of first importance to most people wishing to build. Its situation here is not because the settlement of accounts is the natural conclusion of nearly every building contract, but rather for the reason that estimates can only be given after such items as accommodation and materials have been discussed and decided upon.

INCREASING COST OF BUILDING

During the last twenty-five years the cost of all building undertakings has increased by not less than 30 per cent. For this, in a great measure, we have to thank new building enactments and the multiplication of what have become necessities, but it is mainly on account of enhanced prices all round, both in wages and building materials.

HOW LOCALITIES AFFECT PRICES

The cost to build the houses and cottages illustrated in these pages are given in all cases, and these may be found of some value for comparison. Yet we must remember that it does not follow that because a building has been erected

for a certain sum in one district, it can be duplicated some where else for precisely the same price. Without actual knowledge of its precise neighbourhood and nearness to brickfield, quarry, and railway station, and the local price of labour and so forth, it is impossible to determine with fair accuracy what the total cost will be.

For instance, some districts are rich in materials, as, for example, Peterborough, where bricks can be obtained for little more than half their London prices. And when it is recollected that about two-fifths of the cost of most cottages go for walling, it will be easily understood what large differences are effected by such circumstances. Building in the country is a good deal cheaper—by something like 10 per cent.—than near London, where material often, and labour always, fetches higher prices. But the fact that wages are lower away from towns will often be balanced in a building five miles from a station by the extra 5s. for cartage on every ton of building material that cannot be obtained in the locality.

OTHER FACTORS INFLUENCING THE COST

The condition of the building trade in the district at the time tenders are invited has an appreciable bearing on the ultimate expenditure required for a new cottage. In slack times a builder will often be content with narrow profits in order to keep his works going. On the other hand, if trade is good, he is apt to price his estimate at higher rates, partly because a large amount of work prevents him from exercising that personal supervision which guards against loss. Again, it is often cheaper to employ a builder who works on the scaffold himself, thus dispensing with the middle-man.

There is no reason why more building should not take place in the winter. Frost is seldom continuous in this

country, and there is much work that it does not interfere with at all. The winter season is the best time to undertake cartage, and carts and horses are often idle, while labour is then plentiful and cheap.

ADVANTAGES OF BUILDING ROWS

It must not be forgotten that a single cottage is a luxury, for it is always relatively cheaper to build in rows and pairs, because of party walls. In a block of two square cottages, instead of two separate buildings of the same size, the saving is at least one-eighth of the total amount of brickwork required; in a block of three, one-sixth; and in a block of four, three-sixteenths.

Beyond four in a block, the saving is outweighed by several disadvantages. Fig. 103 shows a row of four cottages, in which the two end houses have the benefit of three outside walls for light and air, and of entrances at the side.

STOCK ARTICLES

In an earlier chapter several hints on cheap planning have been given, and to these we would add a few remarks. When a single dwelling is to be built, stock articles and sizes will have to be used, though worthy ones can and should be selected. But in a row or group of cottages, it is often possible to introduce new lines of proved quality without additional expense.

Such materials as thin bricks (which have such a charming effect) cannot be justified where cost is of primary importance. All brick walls should be spaced out in brick dimensions as mentioned in Chapter VII., and set out at right angles, for skew walls mean much cutting of brickwork. By keeping the timbers of stock lengths and sizes we shall always make for economy.

For instance, if floor joists and rafters are only obtainable

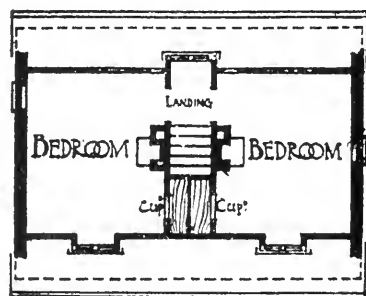
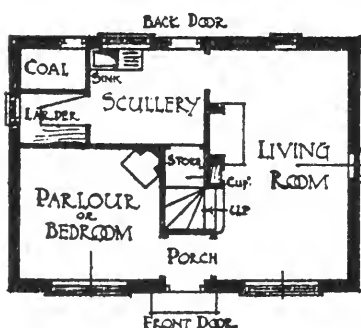
in foot lengths, rooms and roofs should be planned of those dimensions which prevent waste in the cutting of the timbers. The ordinary bridging joists require a bearing of four inches on each supporting wall, so that a clear span of, say, 12 ft. 4 in. is just right for joists 13 ft. long. But in a room 12 ft. 6 in. wide, joists having a length of 14 ft. must be used, which means additional labour in sawing, as well as the waste of material. When it is remembered that both of these items have to be multiplied by a large number on each floor, it is easy to see what a considerable difference is made to the final cost.

Again, as wood is sold by the foot cube, the question of sectional sizes of the various timbers is worth a little more attention than seems to be usual. A beam's strength equals its breadth multiplied by the square of the depth. Therefore when a 9 in. by 2 in. timber—the strength of which is 162, and the sectional area 18 sq. in.—is used in preference to one measuring 7 in. by 3 in. (strength 147), 3 sq. in. are saved, and at the same time the floor will be appreciably stronger. As the amount of square inches saved has to be multiplied by the total number of joists used, as well as by the length of each, the grand total of the saving in timber is very appreciable indeed.

WHERE THE MONEY GOES

In an average building operation, the expenditure on labour is just about equal to that on material. This is exclusive of shop work, and is for labour paid on the job.

Two-thirds of the total cost goes for carcasing (bricklayer, mason, carpenter and joiner), and the remaining one-third for finishing, which includes such trades as tiling or slating, plumbing, plastering, and painting. The price of timber with the carpenters' and joiners' wages take nearly



FIGS. 91 AND 92.—In this little cottage there are two bedrooms in the roof; and a large living-room, parlour (which can be used as a bedroom), and scullery, etc., downstairs, where good storage accommodation is provided. The base of the roughcast walls is tarred, the roof is covered with tiles, and the cost to build in most districts should not exceed £175.

one-third of the contract sum, and the tiler or slater gets one-twentieth for himself and his materials.

PER CUBE FOOT

The best known and most usual way of obtaining an approximate estimate of the cost of a building from the plans is that known as "cubing." It is a process of multiplying the number of cubic feet in the proposed structure by a figure representing the price per foot cube.

This unit of price will, of course, vary considerably, being dependent on the materials selected and the distance of their cartage, the local by-laws and the price of labour, the nature of the fittings and foundations required, and several other conditions already mentioned. Therefore, unless one is sure about the ascertained cost of similar buildings in the neighbourhood, it is easy to make mistakes. Naturally no comparison is possible when one house is built of brickwork plainly plastered inside, and the other constructed, say, of stone with oak-panelled rooms and parquet floors.

However, builders and others with experience soon adjust the correct price per cubic foot. On seeing the plans, and learning the cubical contents and a few particulars—such as the price of bricks and tiles delivered on the site—they can at once, with some degree of certainty, give a close estimate of what a building should cost.

MEASUREMENT

To find the number of cubic feet contained in a building, it is customary to measure the dimensions of the plan over all—that is to say, from out to out walls, and from the underside of the footings to half-way up the roof, or three-quarters up if it contains attics. One's judgment must be exercised as to the exact depth, depending, as it does, very

much on circumstances. Projections and outhouses should be taken separately, and can often be priced at a lower figure.

One thing to remember is that the smaller the space enclosed by the walls, the greater will be the cost of the walling compared with that of the contents. The reduction of the area of certain rooms and of the cubical area of the house does not always mean a proportionate reduction in the price. A room 2 ft. or 3 ft. shorter still requires windows and doors and a fireplace, and the floor and roof timbers have often to be of the same scantling.

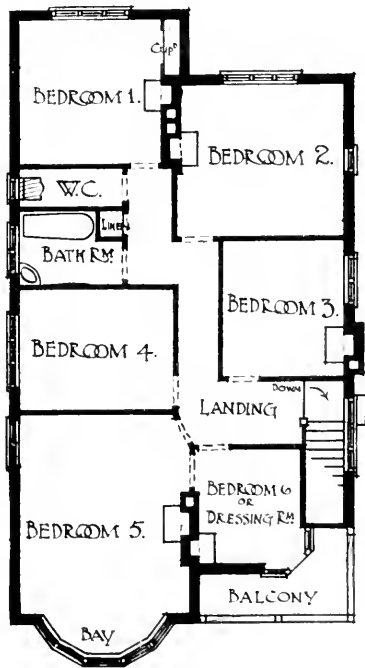
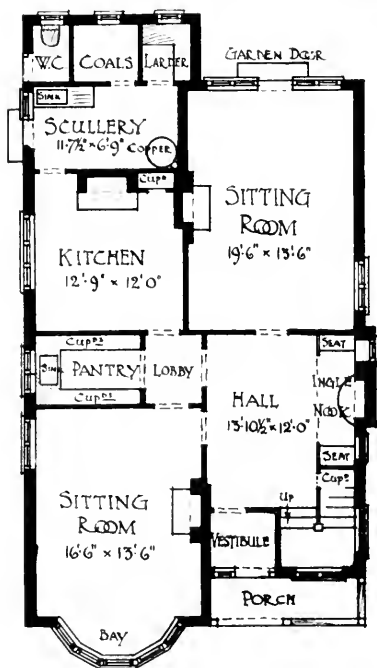
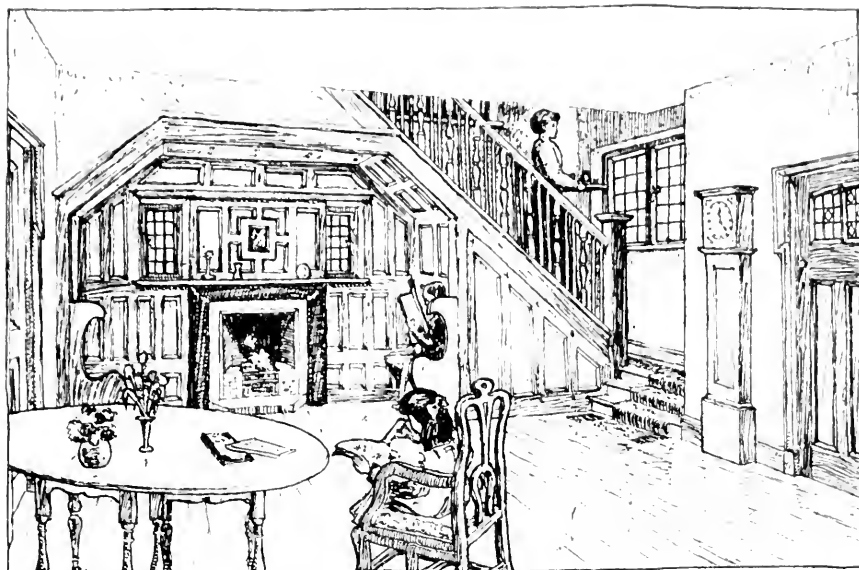
Structures one storey high are comparatively expensive, because the same amount of roof and practically similar excavation and foundations are required as in a building of two or three floors. As a rule, work done in small quantities costs about 25 per cent. more than that in large jobs.

PRICE PER FOOT

First-class cottages cost from 6d. to 7d. per cubic foot, or more if an extra good finish is required. Second-class buildings of plain but sound workmanship can generally be put up for 5d. to 6d. a foot ; while, under ordinary conditions, labourers' cottages have been found to cost from 4d. upwards, varying with circumstances.

SPECULATIVE BUILDERS

Practically all suburban villas and most of the smaller houses in country districts are put up by builders who aim at providing something useful, or at least saleable, that will return as high a profit as possible. Just as other tradesmen gain a living by the commodities they produce, so is the speculative builder interested in his houses. Occasionally, however, when relying on improved ground rents, he loses on the actual bricks and mortar.



FIGS. 93 AND 94.—This house at Bridlington has extensive accommodation, and cost approximately £850 to build. The site being long and narrow is similar to many suburban plots, but it overlooks the sea. A sketch of the hall is given showing an inglenook fireplace, with seats and windows of its own under the stairs; the front elevation appears in Fig. 95. There are five bedrooms upstairs, and a dressing-room opening out on a balcony, from which fine views can be obtained. From the plans it will be seen that the ground floor rooms are of large size, one of the sitting-rooms being 19 ft. 6 in. long and 13 ft. 6 in. wide, and that kitchen offices are well provided. Materials: Brick, roughcast, and tiles.

In other walks of life he who provides for the needs of the community at a cheap rate is considered a public benefactor. But it is not so with regard to speculating builders. They as a class are all lumped together and called "jerry-builders." This, however, is hardly fair. Nowadays there is a number of these builders—and an increasing number too, though unfortunately they are still in a minority—who with the help of their architects, turn out houses reaching a high standard of design and construction.

The improvement in speculatively-built dwellings has been very marked during the last year or two, and is due more than anything to the growing interest taken by the public in matters architectural, as mentioned in our opening chapter. Overflowing the technical papers, discussions and illustrated articles on modern homes now find a place in popular magazines, and even in the daily press. While in the pages of *Punch*, which unfailingly reflect contemporary habits and interests, playful satire in connection with the building arts is by no means uncommon.

THE "JERRY BUILDER"

When comparing the prices of houses, it should always be remembered that the "jerry builder" does not build in the hopes of a steady return on his outlay. His object is to make a quick sale, so that the cost of the inevitable repairs, that are soon required, will fall on other shoulders. There is no doubt, too, that he neither obtains full value for the money laid out, nor employs materials economically, scamp as he may.

A walk through some of the streets of outer London, with their rows of mean houses, built or in building, will go far to prove this. It is not difficult to see that the bricks and tiles or slates, as well as the timber, which have been used, are often perfectly sound, although generally ill-chosen. But

the great failing in these suburban properties is faulty and ignorant construction. Most often it appears to be carried out by piecework workmen, whose sole interest in the proceedings is to produce a superficial appearance of soundness in the minimum of time. There is far from being a lack of comparatively expensive "ornament," such as carved lintels and moulded bricks, for these can be built in as easily as plain ones. The great idea seems to be saving of trouble rather than cost.

GOOD BUILDING PAYS

Sound construction should always be regarded as the first essential, temporary building being only for the rich. Besides the preliminary expenditure, the true test of economy will take into account the cost of repairs to a cottage, and its then value, at the end of, say, ten years. If the outlay is to be viewed as a financial investment, the article of durability must necessarily be a considerable factor in the calculations.

"It should also be borne in mind—in considering the cost of a cottage—the pride that its occupant will naturally take in a well-designed and well-built cottage, causing him to take active pleasure in seeing that every part is well maintained, and so considerably prolonging its life. An ill-fitting draughty window, for instance, is a perpetual annoyance—and is subjected in consequence to forced usage or neglect, both causes hastening its decay. Who is going to spend pains over damp walls and leaky roof? And yet, if repairs are not promptly done at the outset, the mischief becomes integral instead of merely superficial, and consequently expensive to eradicate. It requires a sympathetic eye to detect the beginnings of such mischief, and often it can be easily quelled if taken in hand as soon as it is discovered."*

* We cannot do better than quote from a pamphlet issued by the Rural Housing Association.

There is no faith-healing in building construction, and no other way of minimising the ultimate cost of maintenance of a house than by good sound building in the first instance. Even if it does mean a larger initial outlay, the advantages of a safe return on the money invested is thereby ensured.

A number of individuals—including some architects—make a practice of erecting a country cottage of good design and living in it for a short time until the place has improved and the garden grown up. The property is then sold, and they move away to start building again. In this way some very handsome profits have been made when the house is thoroughly well-built and the neighbourhood chosen with care.

WHAT THE ARCHITECT DOES

From the future cottage-owner's point of view there is no doubt whatever that the most satisfactory result can only be obtained when proper plans and specifications have been prepared and everything carefully considered by an expert who has no pecuniary interest in the materials proposed to be used.

For his fees, which generally amount to 5 per cent. of the total cost, an architect—

- (1) Prepares the necessary sketches and plans of the proposed works ;
- (2) Deposits with the local authorities such drawings and particulars as they may require ;
- (3) Obtains competitive tenders from builders by means of drawings and specifications ;*
- (4) Sees to the signing of the contract ;
- (5) Supplies the selected builder with plans and full-size and other detail drawings of the building, with full specifications of the same ;

* This may easily run to 30 foolscap pages for a small dwelling.

(6) Superintends the work from start to finish, certifying for advances to the builder at intervals ;

(7) Adjusts and checks the final accounts, measuring and valuing additions and omissions.

It is important that the architect should supervise the building to see that it is carried out according to the plans, and also that materials and fittings employed are exactly as specified. Another thing he will do at the settlement of accounts is to make sure that his client gets the benefit of the large trade discounts which are usual. Sometimes there is as much as a quarter to be deducted from the list price of certain goods, and the purchaser is also allowed a discount for cash in addition.

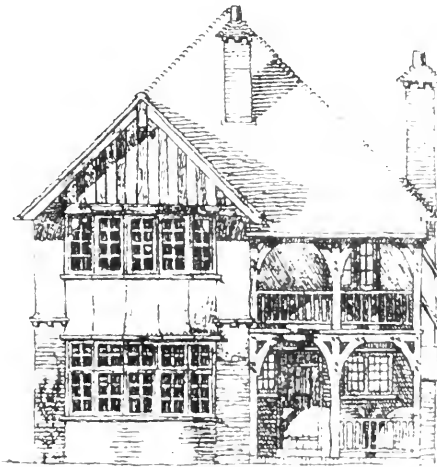


FIG. 95.—The plans and an interior view of this house are shown in Figs. 93 and 94. The ba'cony, which is over the porch, and the bay-window were provided for the sake of splendid views over the North Sea. Roughcast is used on the upper walls, with red brick below, the gable is of half-timber, and the roof is tiled.

CHAPTER X

BUILDING BY-LAWS AND CHEAP MATERIALS

BY-LAWS

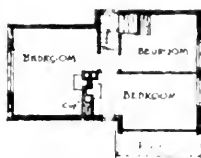
AFTER surmounting many difficulties and having at last taken possession of the site, the would-be cottage owner may be surprised to find out that he cannot build whatever kind of dwelling he likes on his land, even though it is "miles from nowhere." He discovers that Parliament has allowed the local authority to adopt certain regulations controlling the building of all erections intended for human habitation. And possibly he also learns that the by-laws in question were founded on the model series issued by the Local Government Board some 35 years ago.*

Now limitations are undoubtedly necessary for the purpose of insisting on the building of only sanitary and well-constructed dwellings, which might otherwise be prejudicial to the health and safety of the public. But, unfortunately, numbers of rural councils—who were for some unknown reason so ready to obtain "urban powers" in advance of their actual requirements—have adopted rules that were originally drawn up for governing building procedure in city slums. Naturally such by-laws as these—however suitable they may be, or rather *were*, for

* More than one less stringent edition has been issued since then. But the Local Government Board, contrary to general impression, has no power to force localities to adopt building enactments. In fact, the Board has in some cases attempted to dissuade them from doing so. The County Councils, who are supposed to know the districts concerned, are responsible.

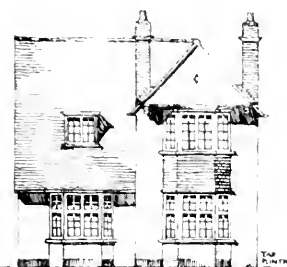


GROUND FLOOR PLAN



FIRST FLOOR PLAN

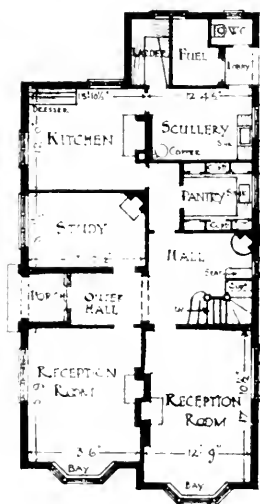
FIGS. 96 AND 97.—Among the economical points of this cottage are : an unbroken roof ; one chimney stack ; no wasteful passages on either floor ; and the stairs are partly in the roof slope. On the ground floor good storage space is provided, and a large living-room and scullery. There are three bedrooms upstairs. The materials are white-washed bricks, the roof being tiled ; and the cost is £140.



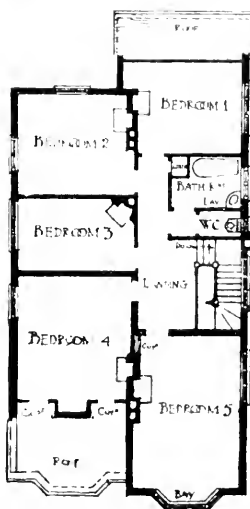
SEA FRONT.



SIDE ELEVATION



GROUND PLAN



FIRST FLOOR PLAN



SKETCH OF HALL

FIGS. 98 AND 99.—This house is next door to that shown in Figs. 93 and 94, to which it is similar in cost. The site faces the sea, and the two front bay-windows were provided in the sitting-rooms for sake of side views. Being in an exposed position the walls are of smooth plaster on stock bricks ; the porch and chimneys are faced with special multi-coloured bricks ; and the roof is tiled to a narrow gauge. The ground floor consists of two large reception-rooms, a study, hall with a small ingie under the stairs (as shown in the sketch), a butler's pantry, kitchen, scullery, etc. Upstairs there are five bedrooms, all having fireplaces, and a bathroom, with a "hot" linen cupboard.

Shoreditch or Glasgow—become vexatious incongruities when made to apply in some open country-side district.

There is no doubt at all that the appalling dearth of housing in rural parts is very largely due to the “ ridiculous by-laws ” in operation. They have had the effect of deterring or adding needless expense and other hardships to the efforts of landlords, back-to-the-landers, and others whose intentions have been to build cottages, which, while being of sound construction and suitable design, would be of an inexpensive character.

WHERE BUILDING IS UNIMPEDED

If those who are unacquainted with the existence of building by-laws are few, it is very different with the number of people who are aware that there is still a large proportion of rural England where any kind of cottage can be erected provided that it does not violate the Public Health Acts.

Out of a total of nearly 700 rural district councils' areas, in 250 there are no regulations in force to control new buildings ; while 300 others have by-laws on the urban model operating in the whole or part of such localities. Considering the counties nearest London : Kent, Surrey, Somerset, Herts, Berks, and Bucks are mostly by-laws-ridden. But in many parts of Essex, Hampshire, and especially Wiltshire, one is able to erect dwellings with the latest materials, and with materials other than the “ brick or stone ” usually required.

SUITABLE FOR HIS MAJESTY BUT NOT FOR COTTAGERS

When a pale-faced city clerk wishes to return to the land of his fathers with his country-bred wife, and to build one of those comfortable and artistic tile-hung or weather-boarded houses in the middle of his field—where he and

the man from the office used to spend their fortnight under canvas with pleasure to everyone, including the village shop and the neighbouring farm—he is told by the authorities that the dwelling cannot be allowed, as it is “unfit for human habitation.”

Or possibly it is, instead of the clerk, some thrifty small-holder, or perhaps a more well-to-do week-ender, who wishes to put up a corrugated iron or an expanded metal and roughcast bungalow, the foundations and chimneys being of brick. Whoever they be, the chances are that they fare no better with the local council, who very likely has just proudly completed a small-pox hospital of the identical materials disallowed for the cottage! Although there are some who may see humour in the fact that Government buildings and those “for His Majesty’s use and service” are carefully exempted from the by-laws, it is certain that among these will be neither our London clerk nor his country-bred wife as they look out for fresh lodgings in Peckham.

Again, if millionaires and other well-off folk can live and sleep in shooting-boxes and golf-houses in the Highlands and elsewhere, and if firemen, policemen, and soldiers, as well as the retainers of crowned heads and royalty, are housed comfortably both in town and country in buildings made of certain materials; why is a cottage similarly constructed in a meadow 100 yds. from the nearest dwelling so shockingly insanitary and dangerous?

It would be extremely inconvenient if a rather wealthier back-to-the-lander, after having refused to submit to the tyranny of the by-laws, had his case tried in one of the courts erected five years ago in the Judge’s Quadrangle of the Strand Law Courts. No doubt the prosecuting Councilmen would decline to enter the building because it

is constructed neither of "brick, stone, or incombustible material," but of iron, plaster, and wood!

REFORMATION COMING

From all accounts and from perusal of model by-laws lately issued, the Local Government Board seem at least sympathetic with the need of amendment in the matter, and for some time past they have been considering the formation of legislature to apply to the erection of isolated bungalows and similar dwellings. In several cases the Board have already sanctioned modifications drafted by the local Councils, which permit, under certain conditions, the building of wooden houses. After such precedents, other Rural Councils would be well advised to give the matter attention, so as to allow the erection of this kind of building in their districts.

The restriction of timber dwellings in towns is obviously necessary on account of the risk of fire, but in the country, especially where a cottage is separated by a large space from its nearest neighbour, the danger of flames spreading need not be considered. In the case of bungalows, the risk from fire applies practically alone to property, for if the door get blocked, escape by windows is easy and safe. Wooden buildings can be strong and sanitary, while their advantages on the score of cheapness are so great that a general relaxation of the by-laws would go far towards solving the problem of housing agricultural populations.

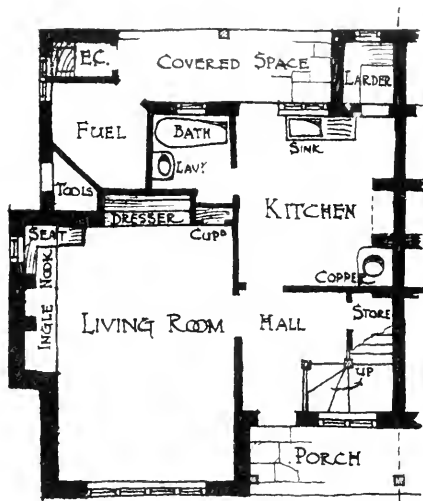
It has been suggested that local building committees should have the power to administer their by-laws according to the merits of each particular application submitted to them. This suggestion, however, seems most unsatisfactory, especially when it is remembered how frequently the building profession is represented on councils, and the chances are that it would aggravate rather than relieve

the present conditions. Also, in addition to illiberal Councillors, there are sometimes landowners behind the building committee, whose very last wish is that more cottages should be built in the neighbourhood. In one case, for land that let for as little as 10s. an acre, the immoderate price of £300 per acre was asked when it was required for building purposes. As a rule, however, the local landlords, peers, and M.P.'s are together doing their best towards the remedying of depopulated rural England.

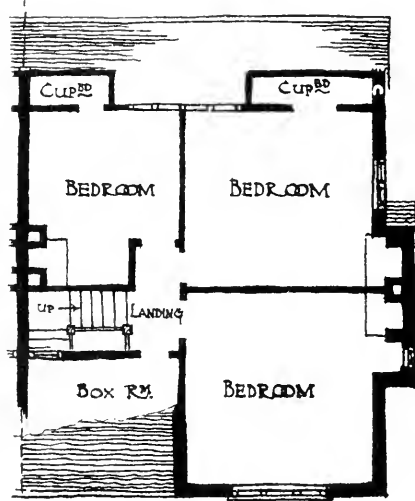
ADVANTAGES OF BRICK

Much attention during the last few years has been given to supplying the unquestionable demand for cheap dwellings for rural workers and for those with limited means who wish to live in the country. Although a large number of more or less successful experiments have been made, it is yet to be proved in districts where bricks may be had cheaply, or where gravel is easily accessible for concrete, that other materials than these are less expensive in the long run. But still, there is no reason why the public should not be allowed to take advantage of modern developments in building practice and employ materials that have in many cases been used by the Government and the Councils themselves.

Meanwhile, until the by-laws are made less stringent, and until a low-priced, easily-handled, fire-resisting and damp-proof substitute is found, the brick cottage must be utilised to the best advantage when first-class building is required in the average district. When, however, dwellings are not intended for posterity, or are put up for holiday use, a cheaper and lighter form of construction is required. Before any of these are discussed we will give a list of a few obvious advantages of brick.



GROUND FLOOR PLAN:



FIRST FLOOR PLAN:



FIGS. 100 AND 101.—These cottages have good accommodation, with a large living-room containing an ingle-nook, a kitchen out of which opens a bath-room with a lavatory basin, and plenty of cupboards have been provided. There are three bedrooms upstairs, with ample lumber and cupboard space. The cost is about £200 each house. Materials: Brick and tiles.

1.—Lower cost of maintenance and longer life than most other materials.

2.—The fire-resisting qualities of brick leave little to be desired.

3.—Insurance is 1s. 6d. per cent. instead of 2s. 6d. on wood-framed buildings.

4.—Bricklaying is an understood art in all districts.

5.—Artistic possibilities with this material are as great as with any other.

6.—When borrowing money to build, it is easier to do so for brick structures.

7.—A brick cottage sells more readily than one of most materials.

HOW UNNECESSARY RESTRICTIONS ADD TO THE COST

The regulation applying to the use of concrete construction is quite uncalled for. A jointless concrete wall is stronger than one of brickwork of equal thickness, but as it is not of "good bricks, stone, or other hard and incombustible materials, *properly bonded*," some by-laws insist that the "thickness shall be one-third greater." This means at least a 12 in. wall for concrete cottages though, really, walls half this thickness, or less if re-inforcement is used, are sufficient. In some houses recently built, the height of the walls just exceeded the statutory limit for 9 in. in brickwork, thus entailing a thickness of $13\frac{1}{2}$ in. for the ground storey walls. But as concrete was proposed to be used in the walls, they had to be one-third thicker. So for a height of 12 ft. the walls were constructed of solid concrete 18 in. thick, which gave rise to all sorts of local rumours about new forts and anarchists.

Another item of wasted outlay is the unnecessarily heavy construction of outbuildings, sculleries, etc., with

the required 9 in. walls. There are many excellent fire-proof slabs made out of asbestos and fine concrete, now obtainable. Where light external walls are required, some of these, or tile blocks, or 4½ in. brickwork might well be used with economy in space and money. These thin walls require to be rendered with a weather-proof material like Portland cement.

In workmen's cottages and others of limited space, where only two bedrooms can be arranged on the upper floor, the third room can be provided most cheaply in the roof. But according to the Local Government Board model by-laws, if this is done, the thickness of the ground storey walls and consequently their cost has to be increased by 50 per cent.

An annoying and useless restriction is that which requires the party walls of cottages to be carried up 15 in. above the roof. Although the more enlightened Councils have dropped this by-law, its effect will be seen in Figs. 20, 21, and 54, where it caused much additional expense in the building. Besides, the ugliness of breaking up the roof and the necessity of expensive flashings, etc., there is the risk of water finding its way through the joints, and also of soaking through the exposed wall.

LATH-AND-PLASTER AND MODERN ADAPTATIONS

It is a great mistake to think that framed buildings must necessarily be inflammable, cold in winter and hot in summer, or of a temporary character. In country and other districts, especially those outside stone-yielding areas, hundreds of lath-and-plaster houses have been in existence for centuries. The construction consists of stout upright timbers, generally of oak, and 12 in. apart, morticed into horizontal cell and head pieces, and sometimes braced with diagonals and all framed together.

The whole was weather-boarded or tile-hung, or lathed and roughcasted over-all or between the timbers, which were sometimes filled in with brick or clay.

Nowadays, walls built after this style can be made fire-resisting and impervious to vermin by the use of wire-mesh or expanded metal lathing, and several successful houses have been erected with light steel framing instead of wood, which is liable to decay in time. Timber, however, will most often be used for the sake of cheapness, and if it is treated with a preserving solution a sound and lasting job is made. If the timbers are painted with a fireproof solution and the interstices filled in with concrete, the walls are as rigid and fire-resisting as brickwork, and even more weathertight if rendered outside with cement, or tile-hung.

Apart from the cheapness of these dwellings, the rapidity of their construction is often a great advantage. It is a question of days rather than weeks if brickwork were used, there being no wet mortar joints to dry. The structure is very simply put together—an ordinary carpenter can do all that is necessary,—and it requires only cheap foundations, being of a light nature.

Where the model by-laws are not rigidly enforced, sometimes a “temporary” dwelling-house may be put up after obtaining a licence from the local Council. Nominally it is renewable every year, and the Council generally retain, though rarely enforce, the right to order the removal of the building at a ten days’ notice. No small advantage of a portable house on rented land is that it is a tenant’s fixture.

MANUFACTURERS’ BUNGALOWS

It is essential that those contemplating business with firms advertising iron and wood buildings, should realise

exactly what is specified to be carried out for the price stated. Often these cottages are of good value; but often they are not. Sometimes the absolutely necessary "extras" add as much as 50 per cent. more to the advertised cost.

Occasionally the drains are not allowed for, though no cottage can do without some, however primitive such arrangements are kept. Again, the cost of foundations, chimneys, and grates, as well as the water supply, may be extra. Then carting from the station, and packing, besides the return of empties, often has to be paid by the purchaser, who perhaps also "provides assistant labour if required."

Care, too, must be taken to understand thoroughly the designs and specification of the actual structure. What are the fittings like, and, more important still, are the dimensions and qualities of the materials suitable? Comparatively small items, such as the addition of a layer of felt in the walls and roof, make a considerable difference to the comfort of these dwellings. It should be seen that the estimate includes painting all ironwork—even if it is galvanised—and exposed wood.

CHEAP AND PATENT MATERIALS

Much of the progress recently made in the way of cheap construction has been dependent on the loopholes that may be found to evade the by-laws.

Instead of tiles or slates, some of the several patent inexpensive roofing materials are extremely useful. Most of these have asbestos as the basis of their composition. They are fire-resisting, good non-conductors, insect proof, and made in shades of red and grey. Being light in weight, they allow the rafters to be both smaller and farther apart from each other than usual.

Corrugated iron is often used for roofing ; but it has many disadvantages besides its appearance and conductivity. Even when galvanised it requires painting frequently ; and another disqualification is that the noise of wind and rain beating on the iron is a great annoyance to those under it.

Boarding, tarred felt, and the patent asphalted materials are non-conducting, weather-tight, and in many ways convenient roof coverings, but are all inflammable. When wood is used, the joints and grain should run in the direction of the roof slope ; and tarring is useful for preventing the material from warping and splitting under the action of rain and sun.

On the outside of walls, weather-boarding looks best, and lasts longer without attention, if treated with an anti-rot stain instead of being painted. It should be left rough, and be neither planed nor grooved and tongued. Galvanised iron is incombustible, but it is generally used with a wooden framework ; if the interior of such a wall be packed with slag wool, or felted and matchboarded, heat is kept out of the building in the summer, and in during cold weather.

For inside work, plastering is more sanitary and fire-proof than matchboarding, and may be papered and distempered in the usual way. A cheaper finish is obtained by nailing on a stiff canvas, which may either be painted, or obtained in the required shade in the first instance. Another method is to use fire-resisting asbestos sheeting, which is now made in several varieties. It is nailed direct to the studding with butt joints (*i.e.*, without lapping), and it looks well if thin strips of wood are fixed over the joints and thus forming panels.

CHAPTER XI

HINTS ON COTTAGE GARDENS

THE GARDEN PLAN

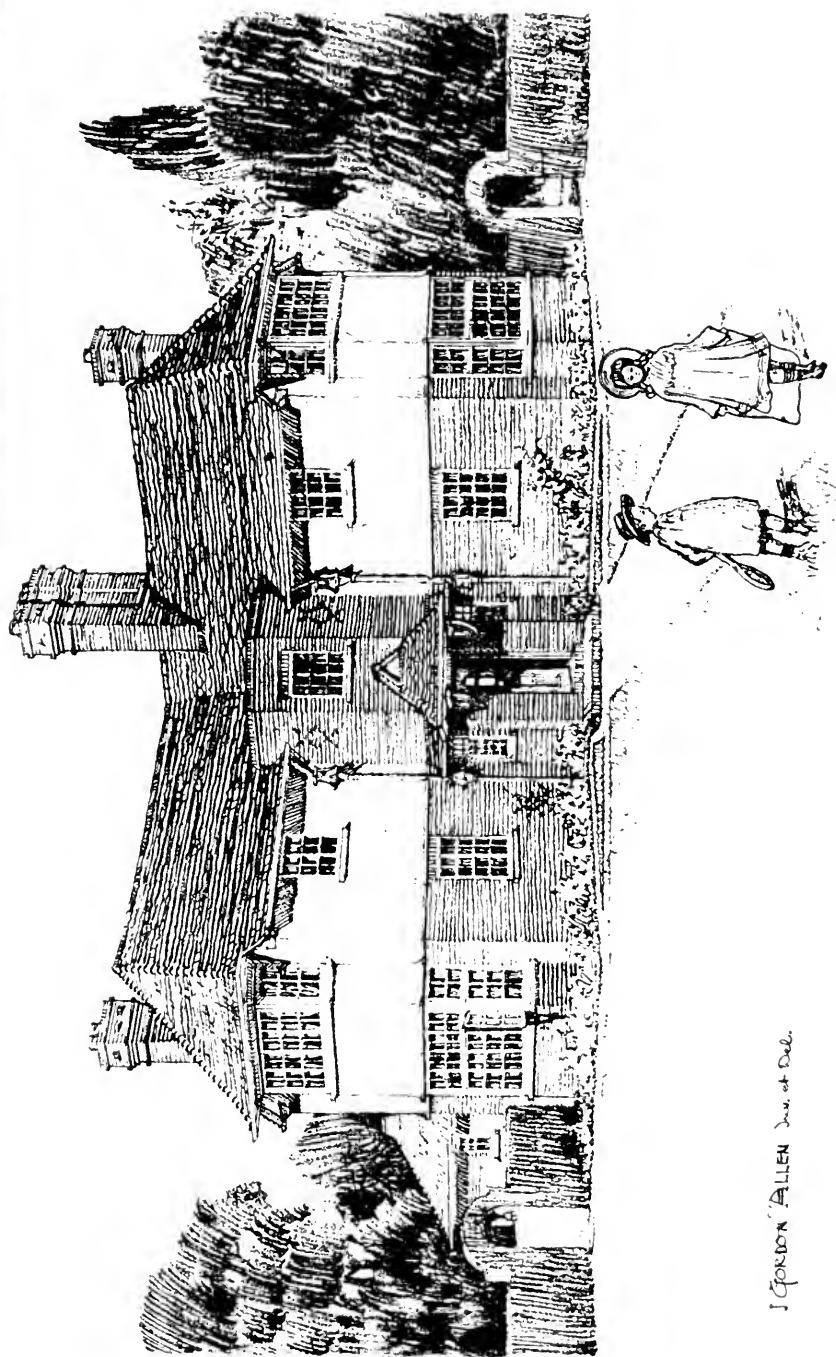
ONE of the first matters we are called upon to settle in the process of building our new home is the general layout of the grounds. There can be no stereotyped design and, of course, the scheming of the house and garden should be done together for a successful result.

Of the controlling factors in the treatment of almost any site, the natural, or created natural, features of and formation of the land, together with the approaches to the dwelling, are the most important. From the road the approach must be obvious, and, unless there is a very good reason, direct; but it must not overlook the whole of the grounds, whatever their size.

The most interesting gardens are never all visible at once from any point of view, but consist of a number of parts screened off from one another and completely different in character and effect, thus offering an inducement for closer inspection. In the usual separation of the flower and kitchen gardens, we have this to a certain degree, and if it is possible to carry the idea further without destroying the "breadth" of the whole, both the interest and the apparent size of our garden will be increased.

DRIVES

For a cottage or small house a drive will rarely be a necessity. In suburban properties it is often introduced



J. GORDON ALLEN *Inv. et Del.*

FIG. 102.—This is another drawing of the house at Barrow-on-Humber (see Figs. 33 and 34), showing the materials as first suggested. It was proposed to build the ground floor walls with 11 in. cavity brickwork, and the upper storey with 9 in. brick walls covered with roughcast. The porch opens into an octagonal hall, which is emphasised exteriorly, and has a hooft roofed with tiles, and supported on oak brackets.

for the sake of the supposed importance given ; but in the country, especially where the house is set far back from the road, a well-placed drive is useful as an access to the garden, and also for the coalman and other tradesmen.

If the minimum width of 8 ft. is thought sufficient, we must remember to keep bushes and trees some way back from either side, and a drive which is curved or next to a building should be a foot or two wider.

The question of turning room is another item of importance, unless there are two entrances. We may have to recess the gates anyway where the frontage is on a narrow lane, for a two-horse brougham can only just turn in 21 ft., and as nearly every motor car requires more than that, a carriage "sweep" should not be less than 30 ft.

A drive should be as flat as possible, but is better with a slight rise or camber in its width for draining purposes. It may be finished with a layer of small stones well rolled in on a foundation of about 6 in. of coarse stone. If gravel is used as a topping, care should be taken to see that it really is clean and sharp, for some kinds of gravel never bind, however much they are rolled and watered. Tar paving requires less attention and wears well ; but its colour is considered unpleasant, especially when adjoining grass.

PATHS

A multiplication of meaningless walks is always to be avoided. Each one should have a special purpose, and those near the house should be straight and formal to be in sympathy with the stiff lines of the building.

A main walk, fairly wide and quite straight from the house to the other end of the garden, makes a charming

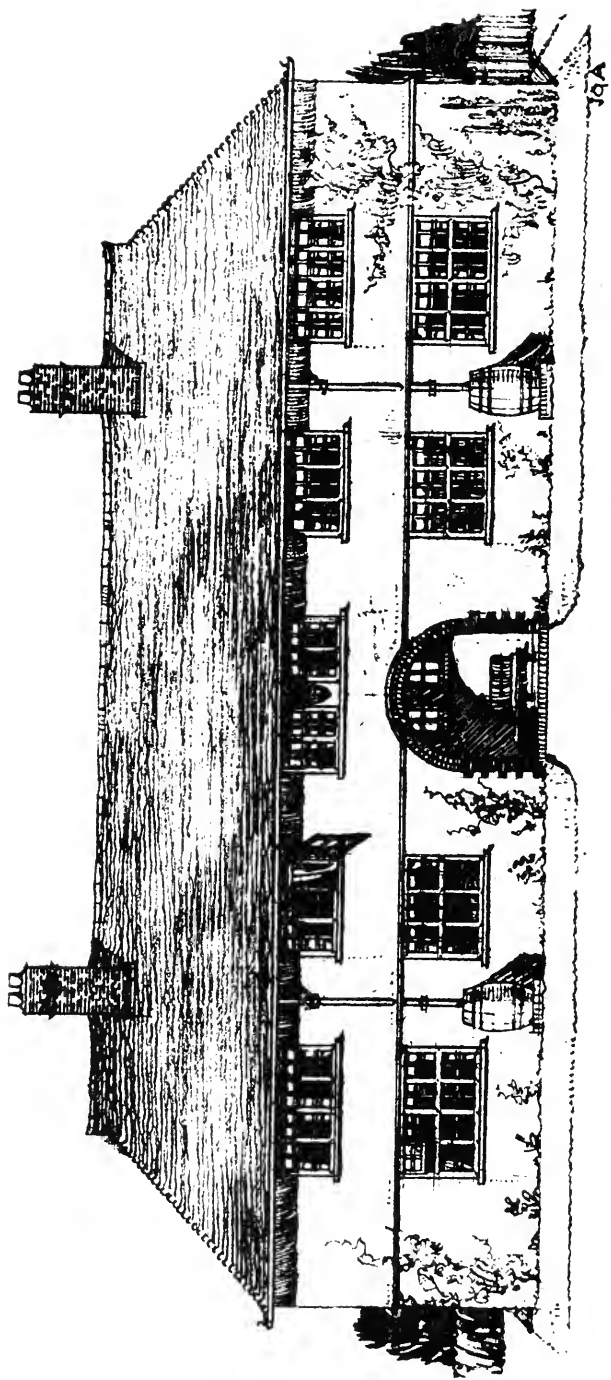
arrangement. All other paths can be kept quite insignificant, joining it at any angle and leading wherever they are wanted among the trees and flower-beds. To make the very most of this pathway, we shall arrange that it comes opposite a living-room window, so that the pleasant perspective view may also be seen from indoors ; and if we can place some interesting feature—like a summerhouse or perhaps a sundial, or seat, with an ever-green background—at the other end, a most attractive vista will be formed. If the path has herbaceous borders, it is well not to plant them too wide or too regular, and their colour and beauty are much increased where there is a backing of green—such as a low hedge of shrubs.

We have already mentioned some paving materials ; but none look as suitable or rustic as old stone flags with wide random joints. Cement paving is another way of making a permanent path, though even with the addition of a colour to disguise its natural grey tint, it is not so pleasant-looking as red brick or tile paving, especially when the latter are not too marked by highly finished workmanship.

Garden steps also should not be too accurately jointed, or they will contrast badly with the ruggedness of nature. To be convenient, they must be low and wide, say about 15 in., with a rise of 4 in.

TREES, SHRUBS, AND FLOWERS

Whatever our treatment of the garden it should be our first object to preserve, as far as possible, the existing trees and bushes. As a rule, no planting will be begun until the house is finished ; but it is always advisable to know where the vegetable earth from the foundations is to be put before the builder arrives, as shifting the soil twice is expensive work. We must take care to keep the



ELEVATIONS:

FIG. 103.—The plans of this block of four cottages are shown in Fig. 104, on the next page. The roof is unbroken from end to end, which makes for simple beauty and cheapness in construction, there also being less likelihood of the roof leaking. All external walls are of brick, those in the upper storey being covered with roughcast, and the roof is tiled.

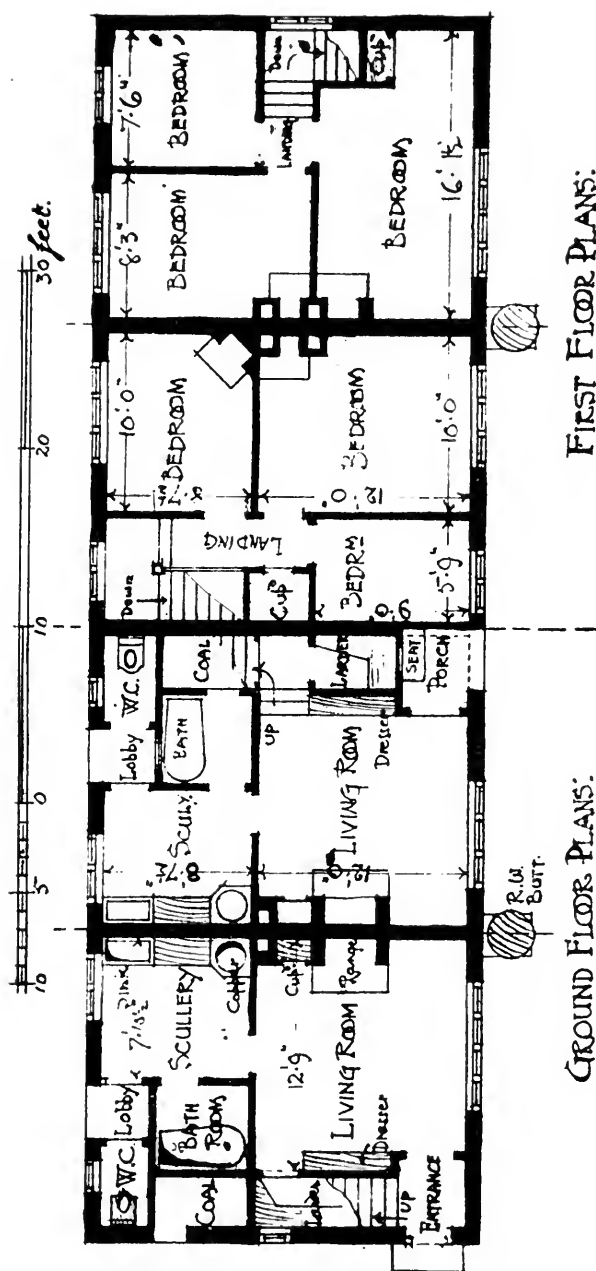


FIG. 104.—These plans are of a block of four cottages, the elevations of which are illustrated in Fig. 103, on the preceding page. Both the ground floor and bedroom plans are shown here. On the lower floor, there is a large living-room, with a cupboard and ladder, scullery, bath-room, etc., all offices being under the main roof. Three bedrooms are upstairs, and two of these have fireplaces. On a practicable site where neither the carriage nor the freight is heavy, the cost of building the block should not exceed £568.

flower beds out of shadow, though of course paths can be planned for these shaded positions.

Shelter from winds is often required where the situation is exposed to gales, and trees are useful for this purpose. Poplar and elm are two of the fastest growing trees ; but the peculiarity of local soil and climate will determine the variety of everything in the garden. The nature of all plants, too, will fix their positions. Large trees look out of place in a small garden, and interfere with the light and air that is necessary inside the dwelling and out. Usually it is better not to plant new trees nearer to the house than the distance of their height.

Shrubs of many kinds are in profusion in most gardens. If placed intelligently, they afford shelter and shade, and privacy where required, besides forming excellent borders and backgrounds. Conifers and evergreens should be chosen to help the garden in the winter ; and where breaks of colour are required, such flowering trees as the rhododendrons, laburnums, lilacs, and almonds may find a place.

TRELLIS AND CREEPERS

Many forms of garden architecture, such as terraces, balustrades, pergolas, and even garden-houses must be used with extreme care to look suitable in cottage gardens. Successful results, however, are often obtained where the least formal designs are employed in a simple manner. Lasting pleasure is given by quiet homely features, and anything lavish and extravagant, especially in a garden however much it impresses by its costliness or intricacy, is apt to pall on that very account.

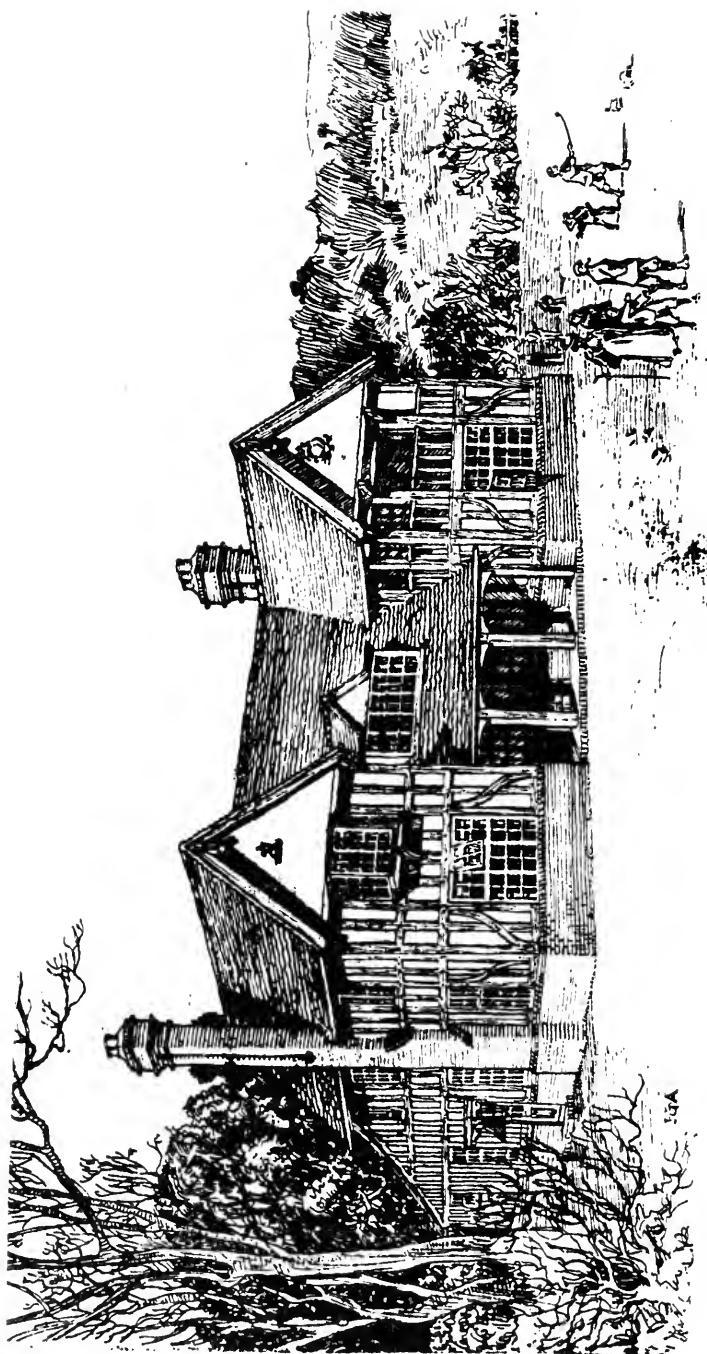
Trellis work is most useful for producing simple picturesque effects in a variety of ways. There is its use to clothe lime-washed and other walls, and well it looks when

painted green against a white surface, even before the creepers have grown an inch. To line walks, and to form arcades, pergolas, backgrounds, and the screens we have mentioned before, it is becoming and easily adapted. Perhaps the trellis will be of the familiar pattern sold by every provider of garden requisites; but it may preferably be of the kind that, instead of diamond, has square lattices, which give a more pleasing effect.

What surprises the practical gardener more than anything is the fondness that amateurs have for the commoner and least desirable varieties of climbing plants. Ivy of most kinds require careful attention, if it is not to be harmful to the fabric itself; and unless the ordinary Virginian creeper is clipped every few weeks in the summer, the gutters and windows soon lose their utility, and the house becomes a shapeless mass. Every aspect, situation, and soil can be suited with choicer varieties, such as jasmine, honeysuckle, roses, clematis, wistaria, and the passion flower, as well as many kinds of wall fruits.

FENCING AND LAWNS

With a site on a dusty road some kind of solid fence may be desirable for protection. Wooden palings are effective and will generally be used, for brick, stone, or concrete walls, however rough, work out too expensive. Nothing looks more homely than an old wayside hedge, and, where possible, it should always be retained. Quick and holly are probably the best for new hedges, but the latter takes a long time to grow. Privet is quick growing, and, like laurel, requires careful pruning and clipping to be satisfactory. Posts and chains have a picturesque appearance in front of hedges (Fig. 15); and open fences all of wood, or of wooden standards tied together with wire, look pleasing and serve their purpose effectively.



A GOLF CLUB-HOUSE

JACOBSON ALLEN, ARCHT., ACCT.

Fig. 105.—The cost of this Golf Club House, which contains a large Club-room, with bar and kitchen accommodation adjoining, ladies' and gentlemen's dressing-rooms, and two bedrooms and a sitting-room for the Secretary, is nearly £1,000. Brick and "half-timber" are used for the walls, and the roof is covered with dark brown tiles.

Lawns require great care and patience. Whether they are to be sown or laid with turf, the needed preparation of the ground is the same : after the earth has been broken up and then settled, it should be rammed to prevent future subsidence. If the area be large, sowing is cheaper than turfing, though the latter is always quicker. Both methods may be done in the autumn ; but the best time for planting seeds is in March or April. The turfs are taken from some old pasture free from weeds, and after being laid perfectly even should be beaten with a turf-beater. Sand sprinkled and well rolled into the grass will prevent it from becoming coarse and rank.

The ground may require subsoil drainage, especially if the lawn is sunk or will be used for tennis or other games. For a tennis-court—78 ft. long and 36 ft. wide—we must allow an extra 10 ft. all round, and more at the two ends if possible, to prevent the players from being cramped. Some kind of solid edging will be found useful to keep rolling balls within easy reach.

KITCHEN GARDENS

A point to be remembered when laying out beds of peas, beans, raspberry canes, and the like, is that the rows should be so placed that the whole length may get the sun when its rays are the most powerful. Vegetable gardens may not always pay ; but it is a great convenience to have a fresh supply of lettuces, etc., so near at hand. The appearance, too, of a kitchen garden and a small orchard near a cottage is charming, if well placed and nicely kept. We must be careful that no part of this garden lies in the shadow of the house, and in small cottages there is no good reason why they should not be in a prominent position, for trim flower-beds are apt to become monotonous unless varied.

Fruit trees always overlap into flower gardens, and look especially well on the borders of a lawn, to which they give welcome shade. When buying apple, pear, plum, or cherry trees, it always pays to have the best. Mid-November is the most suitable time for planting them; and if some material is placed under the soil to prevent roots from penetrating too deeply, this layer should be drained, so that the earth above may be rendered warmer and capable of receiving air and water warmed by the sun.

A wall is the most suitable (and expensive) method of affording shelter to the kitchen garden, and a surface on which to train wall-fruit. Whether it be of brick, stone, or concrete, heat will be accumulated; the warmer side should be wired, while the back often makes an economical place for a shed. Paths are more convenient if wide enough to allow the passing of a handcart, and tile edgings are desirable.

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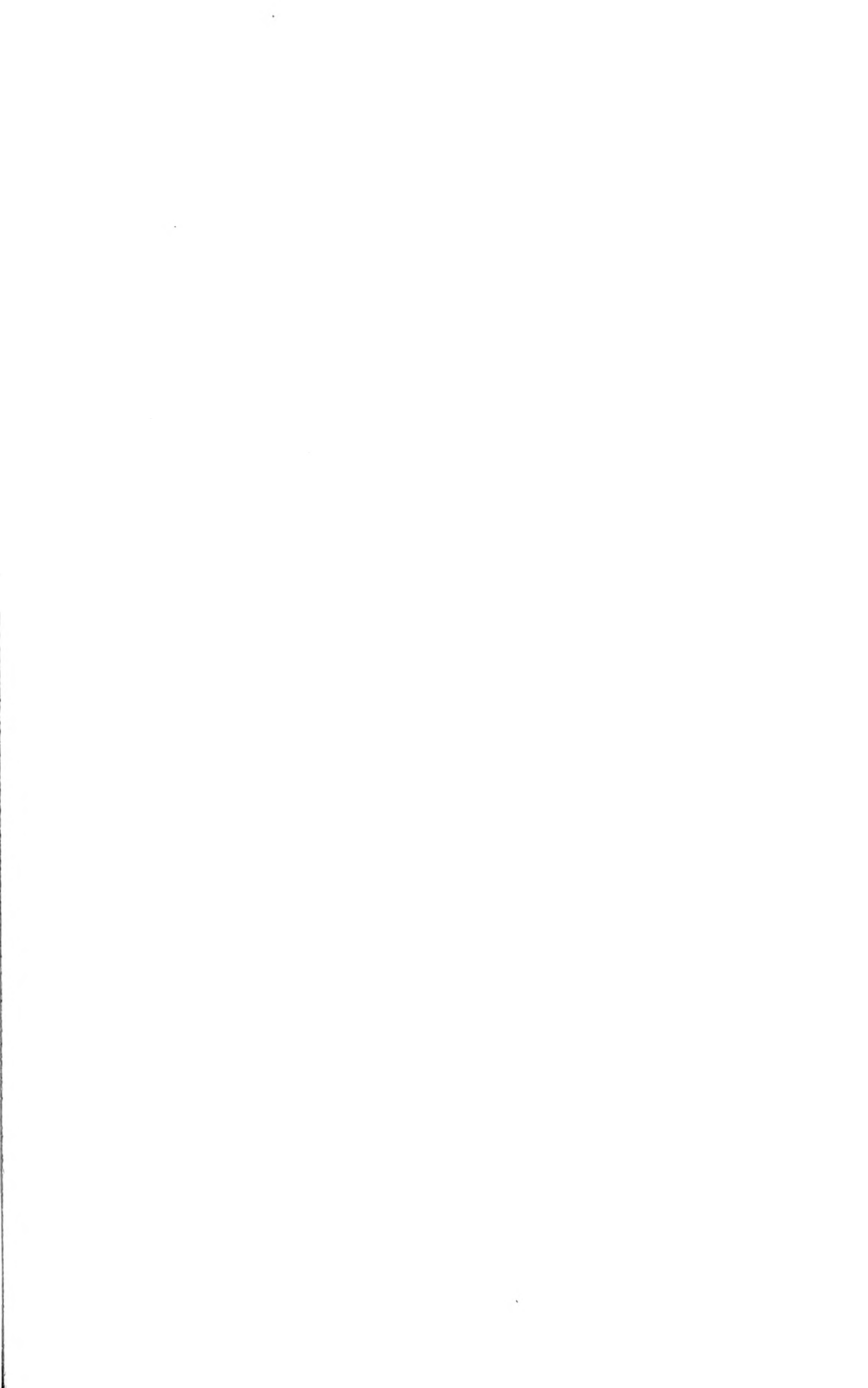
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